

Abstracts of Dissertations

June 2019 Exit Assessment Exercise

BETA-LACTAM ALLERGIES: FACTORS PREDICTING GENUINE ALLERGIES AND PREVALENCE IN HONG KONG

Dr Li Hei Philip, Department of Medicine, Queen Mary Hospital (May 2019 Allergy & Immunology Exit Assessment Exercise)

Introduction Beta-lactams are the most frequently reported cause of drug allergy. The local epidemiology of beta-lactam allergy and the predictors of genuine allergy are unknown. Availability of clinical predictors of genuine allergy and local epidemiological data would be of immense benefit.

Methods Patients admitted to medical wards were analyzed to identify the prevalence and factors associated with the presence of beta-lactam allergy labels. A combined cohort of patients having completed allergy investigation for suspected beta-lactam allergies in Hong Kong and the United Kingdom were analyzed. Association analysis comparing the clinical characteristics of confirmed beta-lactam allergic and non-allergic patients was performed to identify predictors of genuine allergy.

Results Analysis of 4361 admissions over a six-month period indicate that the local prevalence of betalactam allergy labels was 5%, which was associated with female gender and concomitant nonbeta-lactam antibiotic allergy labels. However, patients referred for suspected allergies indicate that the rate of genuine beta-lactam allergy was only 14%. History of anaphylaxis and duration of less than a year since the index reaction were independent clinical predictors of genuine allergy. The negative predictive value of penicillin skin testing was 90%. There was an alarmingly high rate of confirmed piperacillin-tazobactam allergy.

Discussion The estimated true prevalence of genuine beta-lactam allergy in Hong Kong is around 0.5%. This high rate of mislabeling highlights the need for comprehensive allergy evaluation. History of anaphylaxis and duration since the index reaction were clinical predictors of genuine betalactam allergy. piperacillin-tazobactam allergy may pose a unique challenge to our locality.

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PROGNOSTIC NUTRITIONAL INDEX AS A PREDICTOR OF PROGNOSIS IN PATIENTS WITH CRITICAL LIMB ISCHEMIA WHO UNDERWENT ENDOVASCULAR REVASCLARIZATION THERAPY

Dr Chi Wai Kin, Department of Medicine & Therapeutics, Prince of Wales Hospital (June 2019 Cardiology Exit Assessment Exercise)

Background/introduction Patients with critical limb ischemia (cli) have poor prognosis. Prognostic nutritional index (pni) is an established independent predictor of adverse outcome in various chronic illnesses. The use of pni in patients with cli has not been studied.

Purpose To evaluate the impact of pni on 12-month adverse cardiovascular and limb outcomes in cli patients after endovascular revascularization therapy (ert).

Methods 270 consecutive patients with cli (mean age 73.7 ± 11.9 years; 53% male) who underwent ert at a single tertiary referral hospital between January 2009 and October 2016 were prospectively enrolled and analyzed. Patients were grouped by tertiles of pni (lowest ≤ 37.5 ; middle $37.6 - 45.5$; and highest >45.5) at baseline defined as $10 \times$ serum albumin (g/dl) + $0.005 \times$ total lymphocyte count (per mm³). Composite endpoint including all-cause mortality and amputation was considered as primary endpoint. All-cause mortality and amputation were also analyzed individually as secondary endpoints at 12-months.

Multivariate cox proportional hazards regression analyses were performed.

Results Mean pni of the 3 groups were 32.8, 42.2 and 50.4 respectively. Co-morbidities such as end-stage renal failure, heart failure and rutherford classifications 6 were 2 significantly more prevalent in the lowest pni tertile (all $p < 0.05$). Patients in the highest pni tertile was associated with lowest incidence of 12-month composite endpoint (9.9%), all-cause mortality (7.7%) and amputation (3.3%) compared to those in the middle (27.0%, 22.5%, 9.0%) and lowest (52.2%, 47.8%, 16.7%) respectively, and reached statistical significance ($p < 0.05$). Multivariate analysis demonstrated high pni was an independent protective predictor of composite endpoint (adjusted hazards ratio (hr) 0.26, 95% confidence interval (ci): 0.12-0.57) and all-cause mortality (adjusted hr 0.20; 95% ci: 0.09-0.49). Kaplan-meier analysis revealed that higher pni was significantly associated with better prognosis with regard to amputation, all-cause mortality and primary composite endpoint (log rank < 0.05).

Conclusions Our results demonstrated that higher nutritional status defined by prognostic nutritional index (PNI) predicted lower all-cause mortality and amputation rates in critical limb ischemia patients after endovascular revascularization therapy.

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A RETROSPECTIVE CASE CONTROL STUDY ON EFFICACY OF STROKE PREVENTION AND BLEEDING RISK BETWEEN ATRIAL FIBRILLATION PATIENTS WHO HAD LEFT ATRIAL APPENDAGE OCCLUSION (LAAO) PERFORMED AGAINST PATIENTS PUT ON NON-VITAMIN K ANTAGONIST ORAL ANTICOAGULANTS (NOAC)

Dr Chiang Chi Shing Michael, Department of Medicine, Queen Elizabeth Hospital (June 2019 Cardiology Exit Assessment Exercise)

Background Stroke is one of the most devastating complication of Atrial Fibrillation. Both LAAO and NOAC are new effective means for stroke prevention but head to head trial result is not available.

Objective To determine the efficacy of LAAO versus NOAC on stroke (overall, ischaemic, haemorrhage) prevention and bleeding risk (overall bleeding, gastrointestinal bleeding, intracranial haemorrhage).

Method A single centre retrospective case control study, targeting patients suffering from AF indicated for anticoagulation. Consecutive patients with LAAO performed or NOAC newly started between 1 February 2013 till 1 Nov 2017 were recruited, with outcome analysed until 31 August 2018. LAAO(Index) and NOAC(Control) cases were matched in 1:3 ratio. Risk-free survival analysis was performed with Kaplan-Meier method for primary outcome, with differences compared by log-rank test. Multivariate analysis was performed on bleeding risk.

Results 400 cases were included (100 LAAO, 300 NOAC). There was no significant

difference in stroke($p=0.98$), ischaemic stroke($p=0.78$) and haemorrhagic stroke($p=0.84$) risk between the LAAO/NOAC group. There was significantly less gastrointestinal bleeding ($p<0.005$) and overall bleeding ($p=0.02$) in the LAAO group, with relative risk reduction of 81% in overall bleeding. However, there was no significant difference in risk of intracranial hemorrhage ($p=0.98$).

Conclusion LAAO is as effective as NOAC in stroke prevention, with a decreased risk of gastrointestinal and overall bleeding.

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COMPARING PHARMACOINVASIVE STRATEGY AND PRIMARY PERCUTANEOUS CORONARY INTERVENTION IN ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION

Dr Ho Ka Hei Carmen, Department of Medicine & Geriatrics, Tuen Mun Hospital (June 2019 Cardiology Exit Assessment Exercise)

Background Primary percutaneous coronary intervention (PCI) is the preferred reperfusion strategy in ST-segment elevation myocardial infarction (STEMI) according current guideline recommendations. However, this strategy is not yet fully implemented locally due to resource limitation and logistic difficulties. Pharmacoinvasive strategy has emerged as a promising alternative.

Method From August 2016 to November 2018, patients with STEMI who presented within 12 hours of symptoms onset were recruited. Primary PCI would be performed if patients presented in PCI-capable period (8am-8pm, Monday-Friday). Pharmacoinvasive strategy, defined as fibrinolysis followed by early angiography within 3-24 hours, would be implemented if patients presented out of the timeframe. Urgent coronary angiography was allowed anytime if there was evidence of failed fibrinolysis. Primary endpoint was a composite of death from any cause, cardiogenic shock, congestive heart failure and reinfarction at 30 days.

Results Primary endpoint occurred in 11 of 106 patients (10.4%) in pharmacoinvasive group and 12 of 102 patients (11.8%) in primary PCI group. 16 patients (15%) required emergency PCI due to failed fibrinolysis. There was higher rate of TIMI III flow upon baseline angiography in pharmacoinvasive group, while use of thrombus aspiration, glycoprotein IIb/IIIa inhibitor, no-reflow treatment and inotropes were significantly higher in primary PCI group. The rate of intracranial haemorrhage and overall bleeding event was low in pharmacoinvasive group (1.9% and 3.8% respectively) and was similar between two groups.

Conclusion No statistically significant difference could be shown between pharmacoinvasive strategy and primary PCI in terms of efficacy and safety in patients with STEMI within 12 hours of onset. Rate of intracranial haemorrhage and bleeding was low in pharmacoinvasive group.

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THE PROCEDURAL SUCCESS RATE AND COMPLICATION RATE OF THE LEFT DISTAL TRANSRADIAL APPROACH (LDTRA) FOR CORONARY ANGIOGRAM AND PERCUTANEOUS CORONARY INTERVENTION

Dr Hui Yiu Hong, Department of Medicine, Tseung Kwan O Hospital (June 2019 Cardiology Exit Assessment Exercise)

Aim The aim of this study is to determine the feasibility and the safety of the left distal transradial approach (ldTRA) for coronary angiogram (CAG) and percutaneous coronary intervention (PCI). The ldTRA is more convenient for the operator than the conventional left radial approach. This approach also provides more comfortability in the periprocedural period to right-handed patients, of whom the majority are. Comparing with conventional approach, the other potential advantages of ldTRA are lower bleeding risk, less pain and lower risk of radial artery occlusion after the procedure.

Method In this single-centre prospective study, 72 patients undergoing elective CAG and/or PCI were recruited from August to October 2018. Of whom 60 patients (42 males and 18 females ranged from 45 to 86 years of age) underwent CAG and/or PCI via ldTRA. Patient's demographics, success rate of ldTRA, puncture time, procedural time, radiation time, radiation exposure, patient's satisfaction and pain score, complication rate, haemostasis time and radial artery occlusion rate were analysed with descriptive statistics. Line graphic was used to show the difference in the puncture time over different periods of time.

Result The procedure was successful with ldTRA in 51 patients (85%). Crossover to conventional right radial approach was required in 9 patients (15%). In successful cases, patient's satisfaction was 8.3/10 and pain score was 1.6/10. Post-procedural radial artery occlusion was not encountered.

Conclusion ldTRA is a feasible alternative for patients undergoing CAG and/or PCI. It provides good comfortability and results in little pain in right-handed patients. The risk of radial artery occlusion is minimal.

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THE IMPACT OF RENAL INSUFFICIENCY UPON ADMISSION ON THE CLINICAL OUTCOME OF PATIENTS WITH ACUTE ST-ELEVATION MYOCARDIAL INFARCTION UNDERGOING PRIMARY PERCUTANEOUS CORONARY INTERVENTION

Dr Kwong Wai Lun, Department of Medicine, Pamela Youde Nethersole Eastern Hospital (June 2019 Cardiology Exit Assessment Exercise)

Background Coronary artery disease is common in patients with renal insufficiency. In acute coronary syndrome, impaired renal function is present in approximately 30-40% of patients and is associated with worse prognosis. Local data regarding the risks and benefits for those patients suffering from acute ST-elevation myocardial infarction (STEMI) undergoing primary percutaneous coronary intervention (PPCI) is scarce. We evaluated the clinical outcomes of patients suffering from STEMI with and without renal insufficiency upon

admission who underwent PPCI.

Methods From 1st January 2009 to 30th September 2017, all patients with STEMI treated with PPCI were identified. The primary composite endpoint was defined as a composite outcome of all-cause mortality and MACE (cardiovascular mortality, non-fatal MI, stroke and target vessel revascularization). The secondary endpoints were the individual components of the primary composite endpoint. Estimated GFR was calculated by the CKDEPI equation. Renal insufficiency was defined as eGFR <60mL/min/1.73m².

Results The cohort consisted of 450 patients of whom 191 patients (42.4%) had renal insufficiency. Compared with patients with normal renal function, they were older, more often female and more likely to have other co-morbidities. After taking potential confounders into account in the multivariate analysis, patients with renal insufficiency had a higher risk of primary composite outcome during long-term follow up with an adjusted hazard ratio of 1.48 (95% CI 1.02-2.15, *p*=0.038). They also had significantly higher risk of all-cause mortality, MACE and cardiovascular death with adjusted hazard ratios of 1.66, 1.90 and 2.01 respectively (*p*<0.05). The 5-year primary composite outcome event rate was estimated to be 55.4%.

Conclusion In an unselected cohort of STEMI patients treated with PPCI, renal insufficiency was associated with adverse clinical outcome when compared to STEMI patients without renal insufficiency.

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THE USE OF DRUG COATED BALLOON IN DE NOVO SMALL CORONARY ARTERY LESION

Dr Lam Lap Tin, Cardiac Medical Unit, Grantham Hospital (June 2019 Cardiology Exit Assessment Exercise)

Purpose The aim of this study is to evaluate the clinical and angiographic outcomes of drug coated balloon (DCB) in treating small vessel coronary artery lesion.

Method 160 symptomatic patients with 183 de novo coronary artery lesions of $\geq 50\%$ diameter stenosis in small vessels $\leq 2.5\text{mm}$ were treated with DCB. 6-month angiographic and 1-year clinical outcomes were analyzed.

Results The mean age of the patients was 64 ± 11 years old, with male predominance (75%). Diabetes mellitus was found in 74(46.3%) patients. The mean reference vessel diameter was $2.10\pm 0.24\text{mm}$. 157(85.8%) patients received paclitaxel-coated balloon (PCB), whereas 26(14.2%) patients received sirolimus-coated balloon (SCB). The mean size and length of the DCB were $2.16\pm 0.26\text{mm}$ and $22.75\pm 7.25\text{mm}$ respectively. Restudy angiography was performed in 144(78.7%) patients at mean duration of 6.4 ± 1.7 months. Angiographic restenosis was found in 18(12.4%) lesions; the late loss was $0.17\pm 0.28\text{mm}$. At one year there were 2(1.1%) cardiac death, 8(4.4%) myocardial infarction and 9(4.9%) target lesion revascularization (TLR), resulting in major adverse cardiovascular event (MACE) rate of 10.9%. When comparing with SCB, PCB yielded a lower 1-year MACE (*p*=0.02, HR

3.77(1.28-11.14), a trend of lower TLR rate (3.8% vs 11.5%, p=0.45) and angiographic restenosis rate (10.7% vs 20.8%, p=0.21).

Conclusion The use of DCB, PCB particularly, to treat small vessel disease had good clinical and angiographic outcomes at 1 year.

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THE UTILITY OF HAS-BLED SCORE IN PREDICTING THE BLEEDING RISK OF ATRIAL FIBRILLATION PATIENTS UNDERGOING PERCUTANEOUS CORONARY INTERVENTION RECEIVING ANTICOAGULATION AND DUAL ANTI-PLATELET THERAPY: A SINGLE CENTER RETROSPECTIVE COHORT STUDY

Dr Luk Yin Cheung Adrian, Department of Medicine & Geriatrics, Kwong Wah Hospital (June 2019 Cardiology Exit Assessment Exercise)

Abstract The Hypertension, Abnormal renal/liver function, Stroke, Bleeding history or predisposition, Labile international normalized ratio, Elderly and Drugs/alcohol (HAS-BLED) score is a validated bleeding risk prediction tool in patients with atrial fibrillation taking oral anticoagulation. Its predictive value in patients with atrial fibrillation undergoing percutaneous coronary intervention receiving combination of anticoagulation and antiplatelet therapy is unknown. This retrospective cohort study sought to validate the accuracy of HAS-BLED score in predicting the bleeding risk in patients with atrial fibrillation who underwent percutaneous coronary intervention receiving both anticoagulation and dual antiplatelet therapy. We calculated HAS-BLED score in 186 patients with AF undergoing coronary stenting and assessed the incidence of bleeding events defined by the International Society on Thrombosis and Hemostasis (ISTH) bleeding scale. Using a HAS-BLED cut off of ≥ 3 , a significantly higher incidence of bleeding was detected in the high HAS-BLED compared to the low HAS-BLED cohort. Such difference of bleeding incidence remained significant in the triple therapy subgroup whereas it became statistically insignificant in the dual-antiplatelet subgroup. The predictive performance was modest (AUC 0.673). Conclusions: HAS-BLED score is a simple and useful tool to predict bleeding risk in group of AF patients who require triple therapy after percutaneous coronary intervention.

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EFFECT OF LOW BODY MASS INDEX IN OUTCOME OF MICRA LEADLESS PACEMAKER IMPLANTATION

Dr Tam Tsz Kin, Department of Medicine & Therapeutics, Prince of Wales Hospital (June 2019 Cardiology Exit Assessment Exercise)

Background Implantation of Micra transcatheter pacing system (TPS) requires introduction of a large caliber delivery catheter into patient's venous system and right heart. While the investigational device exemption study population had a mean body mass index (BMI) of 27.6kg/m², implantation outcome in patients with small body size requires further investigation. This study sort to evaluate the effect of low BMI in outcome of Micra TPS implantation.

Method Consecutive patients undergoing Micra TPS implantation between 19 September 2015 and 24 May 2018 in a single tertiary referral center was studied. Procedure efficacy outcome was defined as successful implantation with threshold being low ($\leq 2.0V/0.24msec$) and stable (increase in threshold of $\leq 1.5V / 0.24 msec$) tested at

implantation and all clinical follow up in the first year. Procedure safety outcome was defined as absence of major complications in the first year after implantation. A primary analysis was planned to identify factors affecting the composite procedure efficacy and safety outcome, with the hypothesis that low BMI would be associated with poor composite outcome. A secondary analysis was planned to study the effect of BMI on final implant position, number of device deployment and procedure time.

Results 147 patients were included in the study. The mean BMI of the cohort was significantly lower than the investigational device exemption study ($23.7 \pm 3.7 \text{ kg/m}^2$ vs $27.6 \pm 5.3 \text{ kg/m}^2$, $p < 0.0001$). Composite procedure safety and efficacy outcome was reached in 136 patients (92.5%). Low BMI and low body weight were both associated with poor composite procedure and safety outcome ($p = 0.001$ and $p = 0.007$, respectively). After dividing the included patients into low BMI and high BMI using median BMI of 23.76 kg/m^2 as cut off, low BMI group was more likely to result in mid or high septal deployment (51% vs 17%, $p < 0.001$), required more deployment attempts (1.86 ± 1.97 vs 1.27 ± 0.97 , $p = 0.026$), more likely to require recapture (31% vs 17%, $p = 0.049$) and had a longer procedure time (46.0 ± 20.5 minutes vs 37.7 ± 15.4 minutes, $p = 0.007$).

Conclusion Micra leadless pacemaker implantation in patients with low BMI was associated with an unfavorable composite efficacy and safety outcomes. Implantation in patients with low BMI was associated with a higher implantation position, requiring more deployment attempts and longer procedure time. More data is needed to determine the optimal pacing approach for this high-risk group of patients.

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ECHOCARDIOGRAPHIC PARAMETERS ON PROGNOSIS OF PATIENTS WITH INFECTIVE ENDOCARDITIS, A RETROSPECTIVE, SINGLE-CENTERED STUDY IN HONG KONG

Dr Tsoi Ho Ling, Department of Medicine, North District Hospital (June 2019 Cardiology Exit Assessment Exercise)

Introduction Infective endocarditis has been one of the cardiac conditions that carries significant morbidity and mortality rate. Despite the improvement of multi-modality diagnostic technology, the development of newer generations of antibiotics and the advance of surgical techniques, the complications and mortality rate of patient with infective endocarditis still remains static. Echocardiography is one of the most important investigation modalities in diagnosis of infective endocarditis, which assess the presence of vegetation, patients' cardiac function and detection of complications. Studies have shown that the length of vegetation could be an early predictor of a poor prognosis and higher chance of developing

thromboembolic event. This study aims to identify echocardiographic features or parameters that correlate to poor clinical outcomes of patients with infective endocarditis.

Method Patients admitted to North District Hospital from 1st January 2013 to 31st December 2018 were included in this study. A total number of 110 patients were identified. After reviewing respective patients' clinical records, 97 patients were included in this study. Clinical notes, investigation results and echocardiographic images or report of echocardiogram from patients with infective endocarditis were retrospectively reviewed. Statistical analysis with univariate and multivariate analysis were performed to explore factors that associated with poor clinical outcomes, including in-hospital mortality, need of emergency cardiothoracic operation and presence of embolic events during the same admission.

Results Among 97 included cases, there were 28 cases (28.9%) with in-hospital mortality. Embolic events were seen in 27 (27.8%) of cases and 17 patients (17.5%) requiring emergency cardiothoracic surgical intervention. Age, hypertension, chronic renal impairment and presence of Staphylococcus aureus in blood culture were associated with increased odds for in-hospital mortality in univariate analysis. Major valvular complications seen on echocardiogram were observed to have statistically significant associations with emergency operation. The presence of severe valvular regurgitation (OR 17.5 $p < 0.001$), valvular perforation (OR 10.4, $p = 0.002$) and vegetations located in aortic valve (OR 6.74, $p < 0.001$) were found to have increased odds of requiring emergency operation. Concerning risks of developing embolic events, location of vegetations at tricuspid valve (OR 4.58, $p = 0.04$), presence of multiple vegetations (OR 5.67, $p = 0.005$), and size of vegetations more than 10mm was the strongest predictor of the presence of embolic events (OR 8.21, $p = 0.001$) in multivariate analysis.

Conclusion Multiple echocardiographic parameters with association to poor clinical outcome were identified. Early detection of high-risk echocardiographic feature and prompt management might improve patients' clinical outcomes.

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LONG-TERM FOLLOW-UP AFTER PERCUTANEOUS TRANSVENOUS MITRAL COMMISSUROTOMY: SINGLE CENTER EXPERIENCE

Dr Wong Man Ho, Department of Medicine, Queen Elizabeth Hospital (June 2019 Cardiology Exit Assessment Exercise)

Background PTMC is the standard guideline-recommended treatment for patients with severe symptomatic mitral stenosis and favorable mitral valvular anatomy.

Methods Consecutive patients who underwent PTMC in our institution between 1998 and 2017 were included. Patients who had history of previous PTMC were not included in the present study. The primary endpoint was the composite of all-cause mortality, need for mitral surgery, or repeat PTMC up to a follow-up period of 20 years.

Results Of the 178 patients underwent PTMC, a total of 166 patients (93%) achieved immediate technical success without major adverse events. During the long-term follow-up period (median 8.9 years, mean 9.5 years), the incidence of primary endpoint was 44.7% in all patients. The incidence of death, open mitral valve surgery and repeat PTMC were 14.5%, 25.8% and 4.4%, respectively. For patients with optimal immediate results after PTMC, the incidence of primary endpoint was 29.4% (death, open mitral valve surgery and repeat PTMC were 11.8%, 12.9% and 4.7%, respectively). The estimated twenty-year rates of overall event-free survival, survival without death and survival without re-intervention after PTMC were 28.5%, 71.1% and 37.3%, respectively in all patients; while for patients with optimal immediate results were 40.8%, 77.5% and 51.3%, respectively. The only independent predictor of the primary endpoint was age (hazard ratio: 1.05; 95% CI: 1.01-1.09; $p = 0.029$).

Conclusions Long-term outcomes were significantly dependent on immediate results after PTMC. Patients with optimal immediate results had significantly lower incidence of both the composite and components of the primary endpoint as compared with patients with suboptimal immediate results after PTMC. Prediction of late favorable results in optimal immediate results group was strongly determined by age.

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COMPLETE VERSUS INCOMPLETE REVASCULARISATION IN ON-ST-ELEVATION ACUTE CORONARY SYNDROMES WITH MULTIVESSEL DISEASE

Dr Wong Darren Jat-Lon, Department of Medicine & Geriatrics, Tuen Mun Hospital (June 2019 Cardiology Exit Assessment Exercise)

Background A substantial number of patients presenting with non-ST-elevation acute coronary syndrome (NSTEMI-ACS) is found to have multivessel disease. Recent studies have suggested mortality benefit for complete revascularisation over culprit-only revascularisation. In reality, rarely would culprit-only revascularisation be the strategy employed in the presence of another severely stenotic major non-infarct related artery, nor is a common practice to routinely pursue complete revascularisation. There is a lack of real world, local data on the effect of complete versus incomplete revascularisation in non-ST-elevation acute coronary syndrome.

Methods This is a retrospective cohort study. 209 patients who were diagnosed to have

either non-ST-elevation myocardial infarction (NSTEMI) or unstable angina (UA) with multivessel disease underwent percutaneous coronary intervention (PCI) in a tertiary referral centre. The procedure was classified into complete or incomplete revascularisation. The primary endpoint was major adverse cardiovascular events (MACE), which was evaluated at 30 days and 90 days.

Results A total of 91 (43.5%) patients received complete revascularisation, while 118 (56.5%) incomplete. Both the 30-day and 90-day MACE rates were lower in the complete group (12.1% vs 24.6%, $p = 0.023$; 16% vs 33.1%, $p = 0.012$ respectively) mainly driven by 2 reduced urgent revascularisation (0% vs 6.78%, $p = 0.01$; 1.1% vs 6.78%, $p = 0.081$ respectively). The high primary endpoint rate was chiefly driven by unplanned rehospitalisation, which did not show significant difference between groups (12.1% vs 18.6%, $p = 0.197$; 17.6% vs 27.1%, $p = 0.104$ respectively). The incomplete group was found to have more risk factors including 3-vessel disease, right coronary artery (RCA) involvement, hypertension and diabetes.

Conclusion Our study showed that complete revascularisation in NSTEMI-ACS appeared to be safe, and was associated with a reduced MACE from as early at 30-day follow up compared with incomplete revascularisation. However, patients in the incomplete group had more comorbidities to begin with. Future controlled studies are warranted to identify clinically significant non-infarct related artery in NSTEMI-ACS patients with multivessel disease which may benefit from revascularisation, and to examine whether complete revascularisation is indeed superior to reasonable incomplete revascularisation.

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CLINICAL OUTCOMES IN ELDERLY PATIENTS WITH ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION UNDERGOING PRIMARY PERCUTANEOUS CORONARY INTERVENTION

Dr Yau Kwok Ho, Department of Medicine, Pamela Youde Nethersole Eastern Hospital (June 2019 Cardiology Exit Assessment Exercise)

Background With the aging population, the prevalence of acute myocardial infarction is increasing. There is growing number of elderly suffering from ST-segment elevation myocardial infarction (STEMI). International guidelines recommend primary percutaneous coronary intervention (PCI) for STEMI patients. However, the guidelines are based on randomized controlled trials which often exclude patients with age ≥ 80 . The evidence on primary PCI in the elderly STEMI patients was scarce.

Objectives To compare the clinical outcomes between the elderly STEMI patients and

the young STEMI patients who underwent primary PCI.

Method Data on STEMI patients who underwent primary PCI in Pamela Youde Nethersole Eastern Hospital (PYNEH) between 1st January 2009 and 31st December 2016 were collected retrospectively. Patients were categorized into elderly STEMI group (age \geq 80) and young STEMI group (age $<$ 80).

Result Total 419 STEMI cases were included. There were 328 patients (78.3%) in the young STEMI group and 91 patients (21.7%) in the elderly STEMI group. The elderly STEMI patients had more comorbidities and more severe clinical presentation than the young STEMI patients. Elderly STEMI patients also had longer symptom-to-balloon (275 mins vs 217 mins, $P=0.032$) and door-to-balloon time (111 mins vs 83 mins, $P<0.0001$). The 30-day and long-term primary composite outcomes were higher in the elderly STEMI group (30-day composite outcome: Odds ratio: 2.19, 95% CI 1.26–3.81, $P=0.005$; Long-term composite outcome: Hazard ratio 3.04, 95% CI 2.22–4.16, $P<0.0001$). After multivariate analysis, age alone was not associated with 30-day primary composite outcomes, but was associated with increase in long-term primary composite outcomes and the association was mainly driven by non-cardiac cause of death.

Conclusion Elderly STEMI patients who underwent primary PCI had higher 30-day and long-term primary composite outcomes than the young STEMI patients. Old age alone was not associated with 30-day primary composite outcomes but was associated with long-term primary composite outcomes, driven by non-cardiac cause of death.

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A RETROSPECTIVE STUDY ON THE PREDICTORS OF OUTCOME IN PATIENTS WITH INFECTIVE ENDOCARDITIS

Dr Yiu Yuen Fung, Department of Medicine & Geriatrics, Princess Margaret Hospital (June 2019 Cardiology Exit Assessment Exercise)

Background Infective endocarditis (IE) is associated with significant mortality and morbidity. Recent western studies have demonstrated a change in epidemiology in the past decade but the local data is sparse. This study aims to provide an update on the epidemiology of IE and to identify predictors of adverse outcome of IE in the Chinese population in Hong Kong.

Methods The Clinical Data Analysis and Reporting System was searched for all cases with a diagnosis of IE in Princess Margaret Hospital in the period 2002–2016. All cases which fulfilled the modified Duke's criteria for IE were recruited. Primary outcome was

defined as in-hospital mortality. Secondary outcomes included 1-year mortality, valvular surgical intervention, heart failure, stroke and systemic embolization.

Results A total of 196 patients with 166 definite (84.7%) and 30 possible (15.3%) IE were included in the study. The median age was 60.2 (IQR 45.4-72.1) years and 90.3% had native valve IE. Health care-associated IE (HCAIE) accounted for 32% of cases. The overall incidence (event per 100,000 person) of IE was 2.26 and had remained stable. An increasing trend of HCAIE (p for trend = 0.04) was observed during the study period. *Staphylococcus aureus* was the most frequently isolated organism in the overall study population (37.8%) and among intravenous drug users (85.2%).

The most common complications were heart failure (43.4%), systemic embolization (19.4%) and stroke (18.9%). Early surgery was performed in 8.6% of patients before discharge. In-hospital mortality remained high (29.1%) and was independently associated with higher Charlson Comorbidity Index (OR 1.24, $p=0.001$), heart failure (OR 5.65, $p<0.001$) and the presence of large vegetation ≥ 1 cm (OR 4.67, $p<0.001$). IE due to *Streptococcus viridans* was associated with a better outcome (OR 0.40, $p=0.048$). The crude survival rate at one-year follow-up was 89.2% but up to 10% of survivors suffered an episode of relapse or recurrence at 1 year.

Discussion The present study showed that the incidence of IE remained stable during 2002-2016. There was an increasing proportion of HCAIE and *Staphylococcus aureus* has become the most common causative organism. The diagnosis of IE was associated with high mortality and morbidity. Independent predictors for in-hospital mortality were patient's medical comorbidity, large vegetation size and heart failure, while infection by viridans group streptococci was associated with decreased risk.

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THE INCIDENCE OF DEEP VEIN THROMBOSIS IN AN INTENSIVE CARE UNIT WITH UNIVERSAL VENOUS THROMBOEMBOLISM PROPHYLAXIS PROGRAM
Dr Lam Hoi Yee, Department of Medicine & Geriatrics, United Christian Hospital (May 2019 Critical Care Medicine Exit Assessment Exercise)

Objective Thromboprophylaxis is not a routine practice in Hong Kong. Critically ill patients are at higher risk of venous thrombosis. The object of this study is to evaluate the incidence of deep vein thrombosis (DVT) after a thromboprophylaxis program.

Design and setting This is a retrospective study, in a medical-surgical intensive care unit (ICU) in a regional hospital in Hong Kong.

Methods Intensive care unit in United Christian Hospital has implemented a

thromboprophylaxis program since 2018. All patients admitted to ICU received either pharmacological or mechanical thromboprophylaxis, unless contraindicated. All patients received regular bilateral lower limbs ultrasound screening for DVT. Medical records of patients admitted to ICU from 22nd August to 21st December 2018 were reviewed. The demographic data of included patients, their potential risk factors of DVT, types of thromboprophylaxis used and its complications and occurrence of DVT were recorded.

Results 212 patients were included in the study. Nineteen patients did not receive any thromboprophylaxis. Most patients (76.4%) received mechanical thromboprophylaxis. Common contraindications of pharmacological prophylaxis were recent surgery or procedure of high risk of bleeding (42.9%) and active bleeding (18.9%). Eight patients developed DVT during their stay in ICU. The calculated incidence of DVT was 3.8% (95% confidence interval 1.6-7.3%).

Conclusions With thromboprophylaxis, the incidence of DVT was 3.8%. Further study, such as a prospective study with randomization, may be needed to investigate the effectiveness of thromboprophylaxis in critically ill patients in Hong Kong.

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MULTI-CENTRE RETROSPECTIVE STUDY ON LEGIONNAIRE'S DISEASE ADMITTED TO PUBLIC HOSPITALS IN HONG KONG

Dr Lau Lawrence, Department of Medicine & Geriatrics, Caritas Medical Centre (May 2019 Critical Care Medicine Exit Assessment Exercise)

Background *Legionella* is increasingly common in Hong Kong. It is the second to third commonest micro-organism isolated in community acquired pneumonia (CAP) cases admitted to intensive care unit (ICU) in overseas studies. Legionnaire's disease (LD) is associated with significant morbidity and mortality even with intensive care support. Previous studies have revealed factors associated with poor prognosis. There is no local data on the clinical features and prognosis of adult patients diagnosed to have *Legionella* pneumonia. Studies specifically on patients admitted to ICU are also lacking in the recent decade.

Methods This is a retrospective observational study of LD patients reported on Notifiable Diseases and Outbreak Reporting System (NDORS) and were managed in public hospitals in Hong Kong from January 2012 to December 2017

Results A total of 255 patients with LD were recruited. Most of the patients were male (86.7%, n=221). The mean age was 67 years old. The commonest comorbidities included diabetes mellitus (36.5%) and chronic kidney disease (CKD) (29.4%). The commonest symptoms were fever (89.4%), cough (72.9%) and dyspnoea (62.7%). Acute kidney injury (AKI) occurred in 81 patients (32.2%) at hospital admission. The diagnosis was made by *Legionella* urinary antigen (LUA) in 193 patients (75.7%). Over half of the patients (53.5%, n=136) received appropriate antibiotics on the day of hospital admission and 112 patients (43.9%) required ICU admission, during which 74.1% required mechanical ventilation and 49.1% required renal replacement therapy. ICU mortality was 17.9%. Hospital mortality was 25.9% for patients admitted to ICU and 7.7% for non-ICU patients. High Charlson comorbidity index was independently associated with mortality in non-ICU patients, while higher APACHE II score and vasopressor requirement were associated with mortality in

ICU patients.

Conclusion LD causes considerable mortality and morbidity. Rapid diagnosis with LUA and early empirical antibiotic treatment are needed. Further studies to improve diagnostic tools and therapeutic options are warranted.

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USE OF HIGH FLOW NASAL CANNULA(HFNC) IN AN INTENSIVE CARE UNIT OF A REGIONAL HOSPITAL: A LOCAL RETROSPECTIVE COHORT STUDY

Dr Leung Chi Kin, Department of Medicine, Alice Ho Miu Ling Nethersole Hospital (May 2019 Critical Care Medicine Exit Assessment Exercise)

Background High-flow nasal cannula(HFNC)is a relatively new technique to provide support in respiratory distressed patientsand the use of HFNC in intensive care unit (ICU)setting is increasinglypopular but not well investigated. This study is to review the efficacy of clinical use of HFNC in patients with acute hypoxemic respiratory failure (AHRF) in ICU. The predictive factors for successof using HFNC arebeingevaluated.

Method This is a 5-year retrospective cohort study in patients with AHRF using HFNC in an ICUof a regional hospital in Hong Kong. The primary outcome is to identify the predictive factors for success of HFNC which is defined as noescalation of treatment to non-invasive ventilation (NIV),mechanical ventilation (MV), extra-corporeal membrane oxygenation or death.

Results Of the 124 ICU patients with AHRF, 69 (55.65%) failed in the use of HFNC. For the other 55 patients (44.35%)successfully treated with HFNC, they had lower APACHE IV scores , higher GCS scores, higher platelet counts and serum sodium levels upon ICU admission and lower pH on day of HFNCcommencement. They had lower respiratory rate before HFNC and lower heart ratesbefore and 1 hour after HFNC.The Respiratory rate-oxygenation (ROX) index which is defined as ratio of SpO₂/ FiO₂ to respiratoryrate wassignificantly higherin the success group 1 hour and 12 hours after HFNC.By multivariate binary logistic regression, success of HFNC is associated with higher ROX index at 12 hours after HFNC.

Conclusion High flow nasal cannula is a useful clinical tool in ICU which provides oxygenation support to patients with acute hypoxemic respiratory failure. By using it, asignificant proportion of patients have avoidable intubation and mechanical ventilation. ICU patients who are less sick, more conscious, less compromised in cardiopulmonary condition predict for a success in the use of HFNC. Close monitoring of patients is required to identify failure in using HFNC.Respiratory rate-oxygenation (ROX) index at 12 hour serves as a valuable guideto monitorthe responsivenesssto HFNC treatment.

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IMPACT OF APPROPRIATE EMPIRICAL ANTIBIOTICS ON CLINICAL OUTCOMES IN KLEBSIELLA PNEUMONIAE BACTEREMIA

Dr Man Man Yee, Department of Intensive Care, Pamela Youde Nethersole Eastern Hospital
(May 2019 Critical Care Medicine Exit Assessment Exercise)

Background Klebsiella pneumoniae causes a variety of clinically important infections that are associated with septic shock, multi-organ failure and high mortality. Appropriate empirical antibiotics improves patients' outcome.

Aim To establish the impact of appropriate empirical antibiotics on mortality in Klebsiella pneumoniae bacteremia.

Methods Adults admitted to a regional hospital in Hong Kong with Klebsiella pneumoniae bacteremia from 1st January 2009 to 30th June 2017 were included. Demographics, microbiology and outcomes were analyzed.

Findings In the 8.5-year period, we identified 984 patients with Klebsiella pneumoniae bacteremia. 686 of them received appropriate empirical antibiotics while 298 did not. 205 patients required intensive care. Older patients (Odds Ratio 1.603, $p=0.010$), those with chronic kidney disease (OR 1.814, $p=0.007$), received mechanical ventilation (OR 1.785, $p=0.005$), had respiratory tract infection (OR 1.501, $p=0.034$), and either carbapenem or ESBL resistance (OR 12.510 $p<0.001$) were more likely to have inappropriate empirical treatment. 90-day mortality was significantly higher in inappropriate empirical treatment (46.6% vs 26.7% $p<0.001$). Independent predictors for 90-day mortality include respiratory tract infection (Hazard Ratio 2.818, $p<0.001$), gastrointestinal infection (HR 2.787, $p<0.001$), failed empirical antibiotics (HR 2.088, $p<0.001$), advanced age (HR 1.875, $p<0.001$), solid tumor (HR 1.692, $p<0.001$), medical patients (HR 1.396, $p=0.011$), higher total SOFA score (HR 1.084, $p=0.023$). In critically ill patients, inappropriate empirical antibiotics were significantly associated with longer ventilator days (2 vs 1, $p=0.026$) and higher 90-day mortality (59.6% vs 25.0%, $p<0.001$).

Conclusions Klebsiella pneumoniae bacteremia is associated with high 90-day and ICU mortality. Inappropriate empirical antibiotics doubles 90-day mortality in patients with Klebsiella pneumoniae bacteremia.

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PERIPHERALLY INSERTED CENTRAL CATHETER RELATED DEEP VEIN THROMBOSIS IN CHINESE INTENSIVE CARE PATIENTS: A PROSPECTIVE CASE SERIES

Dr Zhou Miao Chang, Department of Medicine, Queen Mary Hospital (May 2019 Critical Care Medicine Exit Assessment Exercise)

Background The risk of peripherally inserted central catheter (PICC) related upper extremity deep vein thrombosis (UEDVT) amongst Chinese intensive care patients is not well reported. Current literature reports a risk of up to 60%, but this does not correlate with local observations. It is important to assess the risk of UEDVT in the local population, and to verify the feasibility and safety of PICC insertion in the Intensive Care Unit (ICU).

Methods and Material In this prospective study, patients who underwent ultrasound-guided PICC insertion at bedside from June 2018 to January 2019 were recruited. The presence of UEDVT was assessed by ultrasound. Patients with and without DVT were compared to identify significant risk factors using chi-square or Fisher's exact test for categorical data and Mann-Whitney U test for continuous data. The baseline characteristics, PICC insertion, usage and removal details pertinent to the development of DVT were analysed.

Results During the study period, 45 patients requiring PICC insertion were recruited. None of them developed symptomatic PICC-related UEDVT. Asymptomatic UEDVT was found in 4 (8.9%) patients during catheter removal by routine ultrasound study, which represented an incidence of 5.1 per 1000 catheter-days. Patients who underwent major surgery in the previous 30 days had a higher risk of UEDVT (23.5% vs 0%, $p=0.016$). PICC were successfully inserted in all patients under real-time ultrasound guidance without major complications. PICC cannulations were successful at the first venepuncture in 33 (73%) patients. PICC that were successfully inserted at the first venepuncture were more likely to be performed by experienced operators who had more than 5 prior PICC insertion (97% vs 67%, $p=0.014$). Experienced operators needed significantly shorter tourniquet time for cannulation (386 seconds vs 1043 seconds, $p = 0.028$). There was no catheter-related bloodstream infection (CRBSI) identified in this study.

Conclusion PICC inserted in Chinese intensive care patients carries a low risk of UEDVT even without routine prophylactic anticoagulation. Bedside cannulation procedure under ultrasound guidance is feasible and safe. Future studies should be carried out at a larger scale in view of the low incidence of symptomatic DVT to further evaluate patient outcomes and risk factors.

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A LOCAL RETROSPECTIVE STUDY OF IATROGENIC CUSHING'S SYNDROME IN HONG KONG

Dr Dao Ho Yi, Department of Medicine & Geriatrics, Tuen Mun Hospital (May 2019 Endocrinology, Diabetes and Metabolism Exit Assessment Exercise)

Objectives Inappropriate glucocorticoid use leads to iatrogenic Cushing's syndrome. This study aimed to look into (i) the demographics, (ii) the associated morbidities and mortalities, and (iii) the course of recovery as well as predictors of full recovery of adrenocortical function in this group of population.

Methods A retrospective observational study was carried out in two regional hospitals in Hong Kong. Patients with iatrogenic Cushing's syndrome from inappropriate exogenous glucocorticoid use were recruited between January 2004 and June 2017. All

subjects were censored till December 2018 or until mortality occurs. Iatrogenic Cushing's syndrome was defined as morning cortisol < 100 nmol/L or peak cortisol level upon the 1 microgram short Synacthen test < 500 nmol/L, together with a history of exogenous glucocorticoid intake.

Results Of the 145 patients identified as having iatrogenic Cushing's syndrome, 34 (23.4%) achieved full recovery, 38 (26.2%) achieved partial recovery, while 73 (50.3%) had complete non-recovery in adrenocortical function. The median time from diagnosis to last adrenocortical assessment was 2 years (interquartile range 1 to 5 years). Full adrenocortical function recovery was attained in 19.3% of the subjects within 5 years after discontinuation of glucocorticoid. Younger age (odds ratio 0.951, 95% confidence interval 0.907-0.997), lower fasting glucose (odds ratio 0.413, 95% confidence interval 0.207-0.823), higher basal cortisol level upon the first short Synacthen test (odds ratio 1.007, 95% CI 1.001-1.013) and higher delta change between basal and peak cortisol level during the first short Synacthen test (odds ratio 1.013, 95% confidence interval 1.006-1.020) were predictors of full adrenocortical function recovery.

Conclusion After discontinuation of inappropriate glucocorticoid use, full recovery in adrenal functions occurred in 23.4% of patients at a median of 2 years. Age, fasting glucose, basal cortisol level and delta change in cortisol level 3

upon the first short Synacthen test could be potential useful predictors of full adrenocortical function recovery.

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THE IMPACT OF TYPE 2 DIABETES ON BONE HEALTH IN CHINESE POSTMENOPAUSAL WOMEN: A CROSS-SECTIONAL STUDY

Dr Lui Tak Wai David, Department of Medicine, Queen Mary Hospital (May 2019 Endocrinology, Diabetes and Metabolism Exit Assessment Exercise)

Background Type 2 diabetes (T2D) is associated with increased fracture risk despite higher bone mineral density (BMD). Trabecular bone score (TBS), an indirect index of bone microarchitecture, captures T2D-related fracture risk better. Data in Chinese postmenopausal women (PMW) are lacking. Dysregulation of adipokines and hepatokines, the obesity-related biomarkers found in obese individuals, may be pathogenic in diabetic bone disease (DBD).

Objectives We compared bone mass and quality in T2D compared to non-diabetes, further studied differences according to glycaemic status, and correlations between circulating levels of obesity-related biomarkers and bone parameters.

Methodology We conducted a case-control study of Chinese PMW with T2D recruited from Hong Kong West Diabetes Registry, and non-diabetes from the Hong Kong Cardiovascular Risk Factor Prevalence Study cohort. BMD, vertebral fracture assessment, and TBS were measured by dual-energy X-ray absorptiometry. Glycaemic indices, estimated glomerular filtration rate, carboxy-terminal cross-linked telopeptide of type 1 collagen (CTX), and obesity-related biomarkers (adiponectin, adipocyte fatty acid binding protein, and fibroblast growth factor 21 [FGF21]) were measured.

Results 258 non-diabetes and 100 T2D PMW were included. After adjustment for covariates, TBS was lower in T2D ($p=0.018$) despite higher lumbar spine BMD ($p<0.001$) and lower CTX ($p<0.001$). TBS appeared to deteriorate starting from prediabetes, especially in those with preserved renal function. Serum FGF21 inversely correlated with TBS after adjustment for covariates ($p=0.04$).

Conclusions Among Chinese PMW, bone quality was worse in T2D, associated with reduced bone resorption. Bone quality may have deteriorated starting from prediabetes, suggesting need for increase in bone health awareness in this at-risk group. Serum FGF21 may have pathogenic role in DBD.

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HISTOLOGICAL SEVERITY OF NON-ALCOHOLIC FATTY LIVER DISEASE IN PATIENTS WITH OCCULT OR PREVIOUS HEPATITIS B INFECTION

Dr Chan Ting Ting, Department of Medicine & Therapeutics, Prince of Wales Hospital (June 2019 Gastroenterology & Hepatology Exit Assessment Exercise)

Background Some studies suggest that markers of occult or previous hepatitis B virus (HBV) infection are associated with the risk of advanced liver disease and hepatocellular carcinoma (HCC) in patients with chronic hepatitis C. Its impact on nonalcoholic fatty liver disease (NAFLD) has never been evaluated.

Methods 500 patients with biopsy-proven NAFLD and negative hepatitis B surface antigen had serum tested for immunoglobulin G antibody to hepatitis B core antigen (anti-HBc). The NASH Clinical Research Network system was used to assess histological severity.

Results 174 (39.6%) of 500 patients were tested positive for anti-HBc, who were older (56.1 vs 50.4 years-old, $p<0.001$), more likely to have type 2 diabetes (71.3% vs 60.1%, $p = 0.193$) and hypertension (66.7% vs 56.1%, $p = 0.02$). The anti-HBc positive group possessed lower levels of alanine aminotransferase (ALT) (56 IU/l vs 71 IU/l, $p < 0.001$), aspartate aminotransferase (AST) (35 IU/l vs 43 IU/l, $p= 0.002$) and gamma-glutamyl transpeptidase (GGT) (67IU/l vs 103 IU/l, $p = 0.001$). Patients with positive anti-HBc had lower steatosis grade (mean score 1.7 ± 0.8 vs 1.8 ± 0.8 ; $p=0.05$) and higher fibrosis stage (mean score 1.7 ± 1.4 vs 1.4 ± 1.3 ; $p=0.01$), but similar degree of lobular inflammation (mean score 1.1 ± 0.7 vs 1.2 ± 0.7 ; $p=0.35$) and hepatocyte ballooning (mean score 0.7 ± 0.6 vs 0.8 ± 0.7 ; $p=0.67$). They were also more likely to have F2-4 (44.3% vs 35.2%; $p=0.047$) and F4 disease (18.4% vs 7.7%; $p<0.001$). The association between anti-HBc and F2-4 (adjusted odds ratio [AOR] 1.14; 95% CI 0.75-1.75, $p=0.54$) and F4 disease (AOR 2.09; 95% CI 1.13-3.87;

$p=0.02$) was partially attenuated after adjusting for age, sex, BMI, waist and hip circumference, history of diabetes and hypertension.

Conclusions Occult or previous HBV infection is associated with more severe histology in NAFLD patients, in particular F4 diseases, after adjusting for age, body size and metabolic factors. The use of anti-HBc in selecting NAFLD patients for cirrhosis and HCC surveillance deserves further evaluation in larger cohorts of NAFLD-related HCC with a longer follow-up period.

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CURRENT STATUS OF PYOGENIC LIVER ABSCESS IN HONG KONG AND ITS PREDICTIVE FACTORS OF RECURRENCE AND IN-PATIENT MORTALITY

Dr Cheng Wing Yee, Department of Medicine & Geriatrics, Princess Margaret Hospital (June 2019 Gastroenterology & Hepatology Exit Assessment Exercise)

Background Pyogenic liver abscess (PLA) is the most common type of intra-abdominal abscess. It leads to a significant morbidity and mortality. Risk factors of PLA were identified in many studies, however, studies on risk factors of recurrent PLA were limited. This study aims to investigate clinical characteristics of patients suffering from PLA and predictive factors of PLA recurrence and inpatient mortality.

Methods A single center 10-year retrospective cohort study was conducted. It included 404 patients admitted in Princess Margaret Hospital, Hong Kong, with the diagnosis of PLA, from 1 September 2007 to 31 August 2017. Clinical characteristics, laboratory parameters, radiological features, bacteriologies, etiologies, clinical management and outcome of these patients were studied.

Results The one-year, three-year and five-year recurrence rate was 2.8%, 8.6% and 17.6% respectively. Recurrent pyogenic cholangitis (RPC) ($p=0.009$) and polymicrobial culture ($p=0.013$) were independent predictive factors of PLA recurrence. *Klebsiella pneumoniae*-associated PLA had a trend towards a higher rate of recurrence compared with other monomicrobial cultures, despite not reaching statistical significance ($p=0.065$). Diabetes mellitus, size of PLA, antibiotic duration and percutaneous intervention were not associated with PLA recurrence. The in-patient mortality rate was 10.4%. It was related to age ($p<0.001$), active malignancy ($p<0.001$), low albumin level ($p<0.001$), metastatic infection ($p<0.001$) and the development of septic shock ($p=0.003$).

Conclusion PLA commonly recurs in patients with RPC and polymicrobial growth. In-patient mortality was associated with age, active malignancy, low albumin level, metastatic infection and the development of septic shock. Patients with PLA related to RPC and polymicrobial growth will benefit from close monitoring and follow up to enable early detection of PLA recurrence. Patients with older age, active malignancy, a low albumin level and those who develop septic shock would require early and aggressive treatment to prevent mortality. An early diagnostic workup would be required to detect metastatic infection, to enable timely appropriate treatment and to reduce mortality and morbidity.

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CLINICAL CHARACTERISTICS AND OUTCOMES OF PATIENTS HOSPITALIZED FOR ACUTE FLARE OF ULCERATIVE COLITIS AND THE PREDICTORS OF ADVERSE OUTCOMES

Dr Fong Man Chung, Department of Medicine & Geriatrics, Tuen Mun Hospital (June 2019 Gastroenterology & Hepatology Exit Assessment Exercise)

Background The incidence and prevalence of ulcerative colitis (UC) has been increasing in Hong Kong. Acute flare of UC frequently leads to adverse outcomes including colectomy, but no local study has evaluated the outcomes of patients hospitalized for acute UC.

Aim To evaluate the clinical characteristics and outcomes of patients hospitalized for acute flare of UC in Hong Kong, and to identify predictors of adverse outcomes.

Methods A retrospective study was conducted. All patients admitted for acute flare of UC with moderate to severe episodes by Truelove and Witts' criteria between 2008 and 2018 were included. The primary outcome was colectomy within index admission. Secondary outcomes included steroid refractory rate, mortality rate and unplanned readmission rate. Univariate and multivariate analyses were performed to identify predictors of colectomy and steroid refractoriness.

Results 93 episodes of acute UC from 74 patients were included, in which 61 episodes were severe and 32 were moderate. The overall colectomy rate was 9.7%. The steroid refractory rate, mortality rate and unplanned readmission rate were 20%, 4.3% and 19.1% respectively. No independent predictor of colectomy was identified. Albumin level (OR 0.841, 95% CI 0.730-0.969, $p=0.017$) and colonic dilatation on imaging (OR 12.78, 95% CI 1.243-131.4, $p=0.032$) significantly predicted steroid refractoriness in multivariate analyses.

Conclusion Patients admitted for acute flare of UC in our locality had a lower colectomy rate and steroid refractory rate than Caucasian populations. Low albumin level and colonic dilatation on imaging help predict steroid refractoriness

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PREVENTION OF RECURRENT IDIOPATHIC GASTRODUODENAL ULCER BLEEDING — A DOUBLE-BLINDED RANDOMIZED CONTROLLED TRIAL

Dr Lau Ho Shing Louis, Department of Medicine & Therapeutics, Prince of Wales Hospital (June 2019 Gastroenterology & Hepatology Exit Assessment Exercise)

Background and objectives Present guidelines are conflicting for the prevention of recurrent ulcer bleeding in patients with a history of *Helicobacter pylori* (*H. pylori*)-negative idiopathic bleeding ulcers, *i.e.* in the absence of *H. pylori* and a drug history of non-steroidal anti-inflammatory drugs (NSAIDs) and/or antiplatelet agents (e.g. Aspirin). This group of patients has a considerable risk of recurrent ulcer bleeding and complication, despite years after the index bleeding episode.

We hypothesized that a proton pump inhibitor (lansoprazole) is superior to a histamine-2 receptor antagonist (famotidine) for the prevention of recurrent ulcer bleeding in this group of patients.

Methods For this industry-independent, double-blinded, randomized controlled trial performed in an academic tertiary hospital in Hong Kong, we screened patients with a history of idiopathic *H. pylori*-negative non-NSAID-related bleeding ulcers. After endoscopic confirmation of ulcer healing, we randomly assigned patients on a 1:1 basis with a computer-generated list of random numbers to receive oral administrations of either lansoprazole 30mg or famotidine 40mg once per day for a period of 24 months. Both patients and investigators were masked to the treatment.

The primary endpoint was recurrent upper gastrointestinal bleeding (defined as documented episodes of hematemesis, melena or per-rectal bleeding; or a drop in hemoglobin ≥ 2 g/dL, with endoscopic confirmation of ulcer recurrence) within 24 months. The primary endpoint was analyzed in the intention-to-treat population with death as the competing risk. The secondary endpoint was the presence of recurrent peptic ulcer detected by the end-of-study endoscopy.

Results A total of 228 patients were enrolled in our study. 114 patients were assigned to each study group, all of whom were included in the intention-to-treat population. Recurrent upper gastrointestinal bleeding was suspected in 10 patients in lansoprazole arm and 10 patients in famotidine arm; which was confirmed by an independent adjudicator in one patient in lansoprazole arm (one duodenal ulcer) and three patients in famotidine arm (two gastric

ulcers and one duodenal ulcer). The cumulative incidence of recurrent bleeding after 24 months was 0.88% (95% CI 0.08%-4.37%) in lansoprazole arm and 2.63% (95% CI 0.71%-6.91%) in famotidine arm ($p=0.313$; crude hazard ratio 0.33, 95% CI 0.03-3.16; $p=0.336$). None of the patients who rebled had used aspirin, NSAIDs or other antithrombotic drugs. Endoscopic ulcer recurrence was detected in 6.1% of patients in lansoprazole arm and 9.6% of patients in famotidine arm respectively. Eight patients in lansoprazole arm and five patients in famotidine arm died respectively. No treatment-related deaths occurred during the study.

Conclusion This 2-year double-blinded randomized controlled trial did not demonstrate any superiority of either lansoprazole or famotidine for the prevention of recurrent ulcer bleeding in patients with a history of *H. pylori*-negative non-NSAID-related idiopathic bleeding ulcers. However, these patients are still at considerable risk of endoscopic recurrence and overall mortality, despite a low incidence of recurrent gastrointestinal bleeding.

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THE USE OF BAVENO VI CRITERIA TO AVOID UNNECESSARY EV SCREENING BY OGD IN PATIENTS WITH COMPENSATED ADVANCED HEPATITIS B-RELATED LIVER DISEASE: A SINGLE CENTER EXPERIENCE

Dr Sze Ka Kin, Department of Medicine & Geriatrics, Tuen Mun Hospital (June 2019 Gastroenterology & Hepatology Exit Assessment Exercise)

Background Upper endoscopy is widely used to screen for esophageal varices in patients with advanced chronic liver disease. However, a significant portion of the endoscopies are normal and may not be necessary. The Baveno VI guidelines advocate by using the combination of a platelet count $>150,000$ cells/ μ l and a liver stiffness measurement (LSM) <20 kPa, can safely exclude clinically significant varices and avoid screening endoscopy. Some investigators also propose the use of Expanded Baveno VI criteria with the combination of a platelet count $>110,000$ cells/ μ l and a liver stiffness measurement (LSM) <25 kPa to avoid more unnecessary endoscopies. This study aims to validate the Baveno VI criteria and the Expanded Baveno VI criteria in Asian patients with compensated advanced hepatitis B-related chronic liver disease.

Method This is a retrospective cohort study from a regional hospital in Hong Kong. 194 Patients were recruited to validate the Baveno VI criteria and the Expanded Baveno VI criteria. The corresponding performance of sensitivity, specificity, positive predictive value, and negative predictive value were assessed. Varices were classified as low risk varices (F1 and without red wale marks) or high risk varices (HRV, F2 to F3 or any grade of varices with red wale marks or Child-Pugh C class)

Results The study included 194 patients with hepatitis B-related advanced liver disease, which 7.7% (15 out of 194) of them were with HRV. There were 68/194 (35.1%) patients met the Baveno VI criteria and none of them had HRV. By using the Baveno VI criteria, it gave a sensitivity 1.0, specificity 0.38, PPV 0.12, NPV 1.0. There were 118/194 (60.8%) patients met the Expanded Baveno VI criteria and one of them (0.8%) had HRV. The Expanded Baveno VI criteria gave a sensitivity 0.93, specificity 0.65, PPV 0.18, NPV 0.99.

Conclusion The Baveno VI criteria and the Expanded Baveno VI criteria both perform well in safely excluding HRV with 100% and 98.5% of patients screened that are free from HRV, respectively. They can reduce 35.1% and 60.8% of unnecessary upper endoscopy respectively.

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IMPACT OF BLOOD TRANSFUSION STRATEGY ON OUTCOMES IN UPPER GASTROINTESTINAL BLEEDING IN HONG KONG

Dr Tsui Wai Man Vivien, Department of Medicine, Queen Mary Hospital (June 2019)

Background Restrictive transfusion strategy in patients with upper gastrointestinal bleeding has been shown to reduce mortality and rebleeding in one randomised controlled trial. Whether this finding can be generalised to patients with multiple comorbidities is unclear. Data in the local population is lacking. This study aims to audit the transfusion practices of a local hospital cluster, and to compare the outcomes of restrictive versus liberal transfusion strategies in patients with upper gastrointestinal bleeding.

Methods A retrospective study was conducted using an electronic health database managed by the Hospital Authority in Hong Kong. Patients with upper gastrointestinal bleeding who underwent oesophagogastroduodenoscopy, and discharged from hospitals in the Hong Kong West Cluster between January 2012 and December 2016 were included in the general analysis. Within this group, patients with a lowest haemoglobin level of 8 – 9.9 g/dL were included in a focused analysis for comparison between liberal and restrictive strategy.

Results Overall, 2400 patients with upper gastrointestinal bleeding were identified. Of these, 51.5% received red blood cell or whole blood transfusion. The focused analysis included 329 patients in the restrictive-strategy group, and 262 patients in the liberal-strategy group. In univariate analysis, restrictive strategy was associated with a decrease in odds of 28-day all-cause mortality (OR 0.51; 95% CI 0.28-0.94; P=0.031) and 28-day rebleeding (OR 0.33; 95% CI 0.13-0.87; P=0.025), but the differences were not significant after multivariate analysis.

Conclusions The study showed no significant difference in the outcomes of both transfusion strategies. Taking into account the potential complications of transfusion, following the recommendation of a restrictive strategy in upper gastrointestinal bleeding is reasonable. Further research is needed to identify if restrictive strategy is safe for patients with comorbidities, especially cardiovascular disease.

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ADRENAL INSUFFICIENCY IN STABLE CIRRHOTIC PATIENTS IN HONG KONG: A PILOT PROSPECTIVE STUDY

Dr Wong Yun Sze, Department of Medicine, Alice Ho Miu Ling Nethersole Hospital (June 2019 Gastroenterology & Hepatology Exit Assessment Exercise)

Background Liver cirrhosis and its complications remain significant morbidity and mortality nowadays. Recently, growing interest was focused on the relationship between adrenal insufficiency and cirrhosis. Despite adrenal insufficiency had been showed in cirrhotic patients during critical illness, little was known about the adrenal function in our local stable cirrhotic populations. We investigated the adrenal function in a hemodynamically stable cirrhotic cohort.

Methods A total of 131 stable cirrhotic patients were enrolled into this study. Clinical and biochemical data were obtained during the baseline visit. Child-Pugh Score and the Model for End-stage Liver Disease were calculated to evaluate the severity of liver disease. Adrenal function was assessed by low dose short Synacthen test. AI was defined by post-stimulation peak cortisol level less than 500 nmol/L. Delta cortisol concentration, which represented the adrenal reserve, was defined as the discrepancy between the peak and basal cortisol concentration. All subjects were followed up for 6 months.

Results The prevalence of adrenal insufficiency was 6.9% (9 out of 131) in this cirrhotic cohort. A significantly higher proportion of AI subjects had history of composite cirrhotic complications (88.9% Vs 51.6%, p = 0.038) and non-bleeding esophageal varices (88.9% Vs 39.3%, p = 0.005) than those with normal adrenal function. AI patients had significantly lower white cell count ($3.9 \times 10^9/L$; p = 0.006) and platelet count ($91 \times 10^9/L$; p

= 0.007).

39 (29.7%) patients had blunted cortisol response with delta cortisol level less than 250 nmol/L. Similarly, a significantly higher proportion of patients with low adrenal reserve had history of composite cirrhotic complications (69.2 % Vs 47.8%, p=0.025). Those subjects had lower white cell count, platelet, low-density lipoprotein cholesterol, total triglycerides and higher plasma bilirubin level as well.

In the univariate regression analysis, history of non-bleeding esophageal varices, white cell count, platelet and total triglyceride were significantly associated with AI. After adjusting the confounders, history of non-bleeding esophageal varices, white cell count and platelet remained statistically significant. On the other hand, history of composite cirrhotic complications, white cell count, platelet, bilirubin and low-density lipoprotein cholesterol were associated with low adrenal reserve in the univariate model. However, only white cell count and platelet were associated with poor adrenal reserve after correcting the confounders.

Conclusion The prevalence of absolute adrenal insufficiency was relatively low in our stable cirrhotic patients, but was more commonly found in patients with a history of non-bleeding varices and cytopenia. Further studies should verify this relationship and determine whether early recognition with timely glucocorticoid replacement can improve the clinical outcomes.

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GASTROINTESTINAL SAFETY OF ORAL ANTICOAGULANTS: A RETROSPECTIVE STUDY IN A REGIONAL HOSPITAL

Dr Yu Ting Fung, Department of Medicine & Geriatrics, Kwong Wah Hospital (June 2019 Gastroenterology & Hepatology Exit Assessment Exercise)

Background Non-vitamin K antagonist oral anticoagulants (NOACs) are widely used for a number of indications, but there are studies suggesting a higher risk of gastrointestinal bleeding (GIB) with NOAC use than with warfarin use.

Objectives To compare the rates of GIB with warfarin and NOACs, and to compare the rates of secondary outcomes in patients with GIB on warfarin and NOACs.

Patients and Methods All patients in Kwong Wah Hospital (KWH) aged 18 or above with a prescription of warfarin, dabigatran, rivaroxaban or apixaban between January 2015 and December 2017 were identified, and their electronic records were reviewed to capture cases with episodes of clinically significant GIB, as defined by overt or occult GI blood loss with haemodynamic instability, ≥ 2 g/dl haemoglobin drop and/or need of endoscopic, angiographic or surgical intervention.

Results A total of 1,639 patients taking warfarin and 1,116 patients taking NOACs were identified during the study period. Sixty-five unique patients (4%) on warfarin developed clinically significant GIB, compared with twenty-five patients (2.2%) in the NOAC group (odds ratio = 1.8; 95% CI: 1.13-2.88). Transfusion of blood products was significantly more common in patients with GIB on warfarin than those with GIB on NOACs (81.5% vs 52%,

$P=0.005$), and the length of hospital stay was significantly longer in the warfarin group than the NOAC group (median 9 days vs 6 days, $P=0.015$).

Conclusion In this retrospective study in a regional hospital, the risk of GIB with warfarin was 1.8 times that with NOACs, and GIB with warfarin was associated with a higher rate of blood product use and a longer length of stay. These findings suggest NOACs carry a better gastrointestinal safety profile than warfarin.

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PREDICTORS OF FUNCTIONAL OUTCOMES IN ELDERLY PATIENTS AFTER HIP FRACTURE SURGERY

Dr Ding Qi, Department of Medicine & Therapeutics, Prince of Wales Hospital (May 2019 Geriatric Medicine Exit Assessment Exercise)

Background Hip fracture causes significant mortality and morbidities in elders. As the incidence of hip fracture grows, the need for rehabilitation after surgery is rising. A thorough understanding of the patient's functional outcomes and their predictors is crucial for effective risk stratification and efficient resource allocation.

Methods This is a retrospective observational study which included 288 hip fracture patients aged ≥ 60 operated at the Prince of Wales Hospital (PWH) and subsequently transferred to the Tai Po Hospital (TPH) for rehabilitation. Modified Barthel Index (MBI) was used to calculate the absolute functional gain (FGa). Functional gain efficiency (FGe) was calculated as FGa divided by length of stay (LOS) in rehabilitation. Potential predictors of FGe were identified using univariate analysis. Multivariate regression analysis was performed to determine the independent predictor(s) of FGe.

Results The mean FGa and FGe were $16.78(\pm 14.79)$ and $0.9(\pm 0.91)$ respectively. The average total LOS was $31.4(\pm 14.8)$ days. The 6-month mortality was 6.9%. Clinical Frailty Scale (CFS), Abbreviated Mental Test (AMT) score, pre-morbid Modified Functional Ambulation Classification (MFAC) and postoperative acute retention of urine (AROU) were found to be significantly associated with FGe in univariate analysis. Multivariate regression analysis showed that the CFS ($B=-0.161, p=0.004$) was the independent predictor of FGe.

Conclusion FGe could be a better outcome measure for functional recovery after hip fracture surgery. Frailty, as measured by the CFS, is an independent predictor of FGe. The CFS could potentially be a practical screening tool to be routinely used in the Ortho-Geriatrics Co-care protocol.

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THE EFFECT OF POST VOID RESIDUAL URINE VOLUME ON 3-MONTH CLINICAL OUTCOMES AND SUCCESS RATE OF TRIAL WITHOUT CATHETER (TWOC) IN INSTITUTIONALIZED ELDERLY

Dr Leung Ka Shing, Department of Medicine & Geriatrics, Tuen Mun Hospital (May 2019 Geriatric Medicine Exit Assessment Exercise)

Background Urinary catheterization was often used to manage urinary retention, but it can generate lots of complications. Early urinary catheter weaning is essential to avoid complications. However, the cutoff value of post void residual urine to guide the need of reinsertion of urinary catheter varies from 50 ml to 400 ml according to various guidelines and protocols. To increase the success rate of trial without catheter (TWOC), our centre has

revised the post void residual urine volume cutoff from 100ml to 300ml for institutionalized elderly. There is little literature on the short-term outcomes concerning the use of different post void residual urine volume cutoff after catheter weaning in institutionalized elderly.

Objective To investigate the safety and efficacy of the latest change of the cutoff value of post void residual urine to guide the need for re-catheterization after trial without catheter (TWOC) in our centre.

Method This is a retrospective observational study on the residential care home for elderly residents who underwent urinary catheter weaning by the Community Geriatric Assessment Team. The clinical records of patients who had been weaned off the urinary catheter successfully were reviewed through the Clinical Management System under the Hospital Authority. The baseline characteristics and the 3-month clinical outcomes were traced. Those patients who were weaned off the urinary catheter successfully at post void residual urine volume 0-100ml were compared with those at 101-300ml for the 3-month outcomes.

Results Total 147 patients were identified, 103 of them (70.1%) had successful weaning off the urinary catheter; with a mean age of 81.8 ± 8.5 , 68.0% of them were female, and 66.0% of them were unable to walk. 59 patients were weaned off the urinary catheter at post void residual urine volume 0-100ml while 44 patients at 101-300ml. The baseline characteristics of these two groups had no statistically significant difference, including age, gender, co-morbidity and medications which may affect the TWOC process. The clinical outcomes were traced at 3-months after successful weaning off the urinary catheter. Among these patients, 7.8% were dead, 11.7% required re-catheterization, 34% needed hospitalization, 7.8% had urinary tract infection, and none of them had deterioration in renal function. There was no statistically significant difference between the two groups of patients who were weaned off the urinary catheter at different post void residual urine volume.

Conclusion By increasing the cutoff value of post void residual urine from 100 ml to 300 ml for guiding the need of reinsertion of a urinary catheter for institutionalized elderly can increase the success rate from 40% to 70% without affecting the adverse clinical outcomes. Post void residual urine volume at 300ml is a reasonable cutoff value for TWOC by balancing safety and efficacy.

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INTRAVENOUS THROMBOLYSIS IN ELDERLY PATIENTS WITH STROKE – YOUNG-OLD VERSUS OLD-OLD

Dr Tam Yuen Yee Ellen Maria, Department of Medicine & Geriatrics, Tuen Mun Hospital (May 2019 Geriatric Medicine Exit Assessment Exercise)

Background and purpose Intravenous thrombolysis with tissue plasminogen activator (IV tPA) is currently the mainstay of reperfusion therapy for acute ischemic stroke, yet local data on IV tPA use in the very old is limited. This study aims to compare stroke outcome and complications after IV tPA between young-old (65 – 79 years) and old-old (≥ 80 years), and to look for other associated prognostic factors on such outcomes apart from advanced age alone.

Methods All elderly patients ≥ 65 years old who were given IV tPA for acute ischemic stroke and further managed in Tuen Mun Hospital between 2015 to 2017 were recruited. Stroke outcomes and complications as in 3-month modified Rankin Scale (mRS), asymptomatic, symptomatic and fatal intracerebral haemorrhage (ICH), in-hospital and 3-month mortality, use of non-oral feeding and new institutionalization upon discharge were compared between the young-old (65 – 79 years) and old-old (≥ 80 years). Logistic regression was used to determine the association between the studied outcomes and patients' age, gender, premorbid functional state, presenting NIHSS and onset-to-needle time.

Results A total of 248 patients were recruited with 114 young-old and 104 old-old. The old-old had less favourable stroke outcome (3-month mRS 0 – 2, 13.5% vs 47.2%), higher in-patient mortality (25% vs 12.5%) and 3-month mortality (31.7% vs 14.6%), more use of non-oral feeding (20.2% vs 7.6%) and relocation to institution (24% vs 11.8%). The rates of asymptomatic, symptomatic and fatal ICH did not differ between the two groups, though age ≥ 80 was found associated with higher risk of symptomatic ICH (adjusted odds ratio [OR] 4.234; 95% confidence interval [CI] 1.178 - 15.227; $P=0.027$). A favourable stroke outcome was associated with younger age (adjusted OR 3.414; 95% CI 1.657 – 7.037; $P=0.001$), better pre-morbid functional status of pre-stroke mRS 0 – 1 (adjusted OR 6.466; 95% CI 2.068 – 20.213; $P=0.001$) and less severe stroke (NIHSS ≤ 25) at presentation (adjusted OR 5.150; 95% CI 1.088 – 24.376; $P=0.039$). NIHSS >25 and onset-to-needle time >3 hrs were associated with increased in-patient and 3-month mortality.

Conclusion When compared to young-old (65-79 years), old-old patients (≥ 80 years) presented with poorer stroke outcomes and higher mortality after receiving IV tPA. Rates of ICH were similar, although advanced age was shown to be associated with symptomatic ICH. Severe stroke with NIHSS >25 and prolonged onset-to-needle time >3 hrs were independently associated with increased in-patient and 3-month mortality.

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FACTORS ASSOCIATED WITH READMISSION IN OLDER ADULTS WITH HEART FAILURE UNDER THE CARE OF INTEGRATED CARE AND DISCHARGE SUPPORT (ICDS) SCHEME CASE MANAGEMENT

Dr Wai Hok Man, Department of Medicine & Geriatrics, United Christian Hospital (May 2019 Geriatric Medicine Exit Assessment Exercise)

Background Older adults with congestive heart failure exacerbation are at risk of readmission. Integrated Care and Discharge Support (ICDS) scheme in Hospital Authority aims at providing support to individuals with high readmission risks through multidisciplinary interventions. However, readmissions due to certain disease is still commonly observed during transitional care.

Objectives To investigate risk factors associated with 28-day unplanned readmission for older adults who have congestive heart failure and been recruited to ICDS case management program. Characteristics of readmission episodes are described.

Methods This is a retrospective study. Inclusion criteria: Age more than 60 or above, admitted to United Christian Hospital for congestive heart failure, post discharge recruited to ICDS Case Management program, between 1st January 2016 to 31st December 2017. Outcome measure: all-cause and heart failure specific unplanned readmission within 28 days post index hospitalization

Results Total 442 patients entered into final analysis. 123 patients had unplanned readmission within 28 days post discharge. Around half of the readmissions were related to decompensated heart failure. Poor salt, fluid and drug compliance, higher heart rate observed at first home visit by ICDS nurse, were associated with increased all-cause readmission. Increased number of home visits by ICDS nurse decreased chance of all-cause readmission.

Conclusion Older adults with poor salt, diet or drug compliance, higher resting heart rate on first home visit by ICDS nurse, were at increased risks for early all-cause readmission. Suggestions were made to further improve the program.

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IDIOPATHIC NORMAL PRESSURE HYDROCEPHALUS IN ELDERLY PATIENTS: A CASE SERIES IN A LOCAL HOSPITAL

Dr Wong Wing Yu, Department of Medicine, Yan Chai Hospital (May 2019 Geriatric Medicine Exit Assessment Exercise)

Background Idiopathic normal pressure hydrocephalus (iNPH) is a relatively rare clinical syndrome associated with a classic triad of gait disturbance, dementia and urinary incontinence. It was often under-diagnosed or misdiagnosed in the elderly patients. Local Chinese data was scarce. Awareness of its clinical symptoms, radiological features and the predictability of CSF removal test for shunt effectiveness are important, as symptoms are potentially reversible.

Objective To review the clinical features, assessment, management and outcomes of twenty-three iNPH elderly patients in a local hospital in Hong Kong.

Study design This is a retrospective case series study.

Method Clinical information of twenty-three patients with the diagnosis of iNPH at age of 65 or older from 2000-2017 was retrieved from electronic records and clinical notes. Demographic data, clinical characteristics, radiological features, treatment modalities and outcomes were evaluated.

Results Among 23 patients with the diagnosis of iNPH, gait disturbance (87%), followed by cognitive impairment (74%) were the most common initial presentations. 39% of patient presented with the complete clinical triad. CT scan was the most common neuroimaging for identify ventriculomegaly. Lumbar tap test was most frequently performed to predict effectiveness for shunt surgery. Shunt surgeries were performed in approximately one-third of the patients, of which 75% had improvement in at least one of the clinical symptoms. Better mobility and functional independency was observed in those with shunting.

Conclusions The diagnosis of iNPH is based on clinical symptoms, radiological features and exclusion of other diagnoses. Elderly patients with iNPH can be benefited by shunt surgery. Despite it is challenging to differentiate iNPH symptoms in elderly from other neurodegenerative diseases, early recognition with proper treatment improves function outcomes and quality of life in elderly patients.

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OUTCOMES OF MYELODYSPLASTIC SYNDROME PATIENTS TREATED WITH HYPOMETHYLATING AGENTS – A SINGLE-INSTITUTION RETROSPECTIVE STUDY

Dr Li Wai Yan Jamilla, Department of Medicine, Queen Mary Hospital (May 2019 Haematology & Haematological Oncology Exit Assessment Exercise)

Objective This study aimed to review the outcomes of patients with myelodysplastic syndrome treated with azacitidine or decitabine, and to identify the prognostic factors that correlated with overall survival, leukaemia-free survival and response to treatment.

Patients and Methods A total of 83 patients with myelodysplastic syndrome or myelodysplastic/myeloproliferative neoplasm who were treated with azacitidine or decitabine at Queen Mary Hospital were included in the study. Patients with chronic myelomonocytic

leukaemia and patients who were treated after progression to acute myeloid leukaemia were analysed in separate cohorts. Baseline characteristics, treatment and clinical outcomes were evaluated retrospectively.

Results The overall response rate was 37.3%, with a median overall survival of 19.6 (range 1.9-71.5) months. For patients in the myelodysplastic syndrome cohort, median overall survival and leukaemia free survival were 22.0 months and 17.0 months respectively. Abnormal cytogenetics, therapy-related disease, high IPSS and IPSS-R scores predicted inferior overall survival. Poor risk cytogenetics and the use of azacitidine as compared with decitabine were associated with inferior leukaemia-free survival. Abnormal cytogenetics predicted lower response rates to treatment.

Conclusion Azacitidine and decitabine produced objective responses in a substantial proportion of patients, and several clinical factors correlated with the overall survival and leukaemia-free survival of patients treated with hypomethylating agents.

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INFECTIOUS COMPLICATIONS IN PATIENTS WITH AUTOIMMUNE DISEASES ON STEROID-BASED THERAPY

Dr Cheng Shui Kuen, Department of Medicine & Geriatrics, United Christian Hospital (June 2019 Infectious Disease Exit Assessment Exercise)

Background Patients with autoimmune diseases are often prescribed steroid-containing therapy. Long term glucocorticoid therapy is associated with infection risk, beyond the contributions of disease itself and co-morbidities. Clinical predictors for serious infections would be useful.

Objectives To assess the incidence and risk factors for infectious complications in autoimmune patients prescribed systemic glucocorticoid therapy in local population of Hong Kong. Mortality attributable to serious infections is also examined.

Method Patients with autoimmune diseases prescribed oral glucocorticoids for 2 or more weeks from 2013 to 2015 were followed from index date until occurrence of serious infections, steroid cessation, death or one year, whichever earlier. Patient characteristics and laboratory findings were retrieved from electronic medical records. Cox proportional hazard models were employed for risk estimation. Propensity score methodology was used in confounding control for steroid dosing.

Results The incidence of serious infections in autoimmune patients on steroid-based therapy was 15.4 cases per 100 patient-years. Patients with cognitive impairment, end stage renal disease, hypoalbuminaemia, chronic lung disease, lymphopenia, an age of 65 years or older, medium to high-dose daily prednisolone equivalent use, recent serious infection and history of stroke were more likely to develop serious infections. The most common infections were respiratory tract infections. Gram-negative bacteria were most frequently isolated. Over half of the patients had active infections at the time of death.

Conclusion Patients with autoimmune diseases on steroid-based therapy had substantial infection risk. Presence of predictors, including lymphopenia at any time point and hypoalbuminaemia, should heighten our risk awareness of serious infections.

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CLINICAL CHARACTERISTICS AND OUTCOME OF *PNEUMOCYSTIS JIROVECI* PNEUMONIA IN PATIENTS WITH AND WITHOUT HUMAN IMMUNODEFICIENCY VIRUS INFECTION

Dr Lau Pui Ling Daphne, Department of Medicine & Geriatrics, Princess Margaret Hospital (June 2019 Infectious Disease Exit Assessment Exercise)

Background *Pneumocystis jirovecii* pneumonia (PCP) is one of the most important opportunistic infections affecting HIV-infected individuals. Over recent years, an increase in prevalence of PCP amongst immunocompromised hosts without HIV infection has been observed, and is found to be associated with more rapid clinical progression and a higher risk for mortality.

Methods A retrospective cohort study was conducted at a tertiary hospital in Hong Kong between January 2008 and August 2018. Patients who presented with clinical syndromes compatible with PCP, confirmed by positive microbiological tests, who were treated with anti-pneumocystis therapy were included in this study. The clinical characteristics, treatments and outcomes were compared between the HIV and non-HIV groups. Subgroup multivariate analysis adjusted for age was also performed to identify prognostic factors for mortality.

Results A total of 168 patients were included in this study, comprising of 126 HIV-infected and 42 non-HIV infected individuals. HIV patients had a more insidious onset of symptoms while the non-HIV group were found to suffer from more fulminant illnesses with higher rates of shock and requirement for renal replacement therapy. A higher proportion of non-HIV patients required mechanical ventilation (66.7% vs 10.3%, $p < 0.001$) and the 28-day mortality was significantly higher in the non-HIV group (47.6% vs 4.8%, $p < 0.001$).

Conclusion *Pneumocystis* pneumonia is a significant opportunistic infection affecting both HIV-infected and non-HIV infected immunocompromised hosts. Non-HIV related PCP is associated with high morbidity and mortality. Clinicians should be vigilant of the possibility of PCP in this population and consider chemoprophylaxis for the patients at risk.

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ENTEROCOCCAL BACTERAEMIA IN A REGIONAL HOSPITAL – A 2-YEAR REVIEW

Dr Yung Sai Kwong, Department of Medicine, Queen Elizabeth Hospital (June 2019 Infectious Disease Exit Assessment Exercise)

Background *Enterococcus* species are important causes of blood stream infections (BSIs). The aims of this study were to identify the predictors of 30-day mortality of enterococcal BSIs and to describe the clinical and microbiological characteristics.

Method This was a single centre retrospective study. All adult patients who were admitted from 1st January 2016 to 31st December 2017 with enterococcal BSIs during hospital stay were included for analysis. Univariate and multivariate logistic regression analyses were performed to identify predictors of 30-day mortality.

Results A total of 101 episodes of enterococcal BSIs were included for analysis. The 30-day mortality rate was 42.6%. Pitt Bacteraemia Score was the only predictor for 30-day mortality. Polymicrobial bacteraemia accounted for 48.5% of the cases. Most of the cases (86/101, 85.1%) were nosocomial or healthcare-associated. Two patients had two *Enterococcus* species isolated from the same blood culture. Out of the 103 *Enterococcus* species isolated, the most commonly isolated *Enterococcus* species were *E. faecalis* and *E. faecium* (42/103, 40.8% for both), 7/103 (6.8%) were resistant to vancomycin. Four were *E. gallinarum* and two were *E. casseliflavus*. One was vancomycin-resistant *E. faecium*.

Conclusion Enterococcal BSIs were associated with high 30-day mortality rate. Pitt Bacteraemia Score was predictive of 30-day mortality

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CLINICAL CHARACTERISTICS AND OUTCOMES OF EXIT SITE INFECTION

AND PERITONITIS DUE TO *SERRATIA SPECIES* IN PATIENTS RECEIVING PERITONEAL DIALYSIS

Dr Au Wing Han, Department of Medicine, Pamela Youde Nethersole Eastern Hospital (June 2019 Nephrology Exit Assessment Exercise)

Abstract *Serratia species* are causative microorganisms for peritoneal dialysis (PD)-related infections including exit site infections (ESI) and peritonitis, but data on these infections are relatively limited. We retrospectively reviewed the clinical features and treatment outcomes of all patients with PD-related infections due to *Serratia species* from 2004 to 2017 in 2 public hospitals in Hong Kong. One hundred and seventy-three patients suffered from *Serratia* PD-related infections (ESI in 161 patients and peritonitis in 22 patients) during a follow-up of 11829 patient-months. Ninety-two patients (53.2%) had impaired immunity. One hundred and forty-two (88.2%) patients with isolated *Serratia* ESI responded to medical therapy and 19 patients (11.8%) required catheter removal. Twenty-two episodes of *Serratia* PD-related peritonitis occurred [3 episodes (13.6%) were associated with ESI while 12 episodes (54.5%) were associated concomitant intra-abdominal pathologies]. The primary response rates to intraperitoneal antibiotics and complete cure rate were 22.7% and 45.5% respectively. Twelve patients (54.5%) with peritonitis required catheter removal (8 had concomitant intra-abdominal pathologies) and nine (40.9%) were converted to permanent haemodialysis. No mortality due to *Serratia* infection was observed. The susceptibility rates to ceftriaxone, cotrimaxazole and gentamicin were 99.5%, 96.7% and 97.8% respectively, and high resistance rate to ampicillin and 1st and 2nd generation cephalosporins were observed. Our data suggested that ESI due to *Serratia* had relatively low risk of progression to peritonitis and high response rates to medical therapy, while PD-peritonitis due to *Serratia* is often associated with intra-abdominal pathologies and had considerable rates of catheter removal and conversion to permanent haemodialysis.

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RISK FACTORS FOR MORTALITY IN ENCAPSULATING PERITONEAL SCLEROSIS: ANALYSIS OF A 18-YEAR EXPERIENCE IN A SINGLE PD CENTRE FROM HONG KONG

Dr Chan Ka Lok, Department of Medicine & Geriatrics, United Christian Hospital (June 2019 Nephrology Exit Assessment Exercise)

Background Encapsulating peritoneal sclerosis (EPS) is a rare but devastating complication of peritoneal dialysis(PD), with prolonged duration of PD as the single most important risk factor.It can result in intestinal obstruction characterized by symptoms of vomiting, anorexia and eventually death. Effective treatment is still not yet available.

Objectives To investigate the risk factors for mortality of 93 severe EPS cases that

were diagnosed between January 2001 and January 2018 at United Christian Hospital, Hong Kong.

Methods This is a retrospective study carried out in a regional hospital. Patients diagnosed with EPS at our centre between January 2001 and January 2018 were identified by both clinical and radiological criteria. Data of demographics, symptoms, treatment regimen and survival were collected and analyzed. Risk factors for mortality were studied.

Results Of the 93 severe EPS cases identified, mean age at diagnosis was 59.2 +/-10.6 years. 49 of them were male (52.7%) and 44 were female (47.3%). The mean duration of PD when EPS was confirmed with both clinical and radiological criteria was 76.2 +/-54.2 months. Mean number of episodes of peritonitis before onset of EPS was 2.62 +/-1.79. Among all risk factors, presence of intestinal obstruction (*OR 1.89, P = 0.017*), and presence of either Gram-negative or fungal peritonitis (*OR 13.394, P = 0.00002*) were independently associated with higher mortality in severe EPS cases. While the presence of hypertension (*OR 0.37, P = 0.027*) was associated with less mortality. Concerning treatment modalities, no significant relationship can be shown in multivariate analysis, meaning none of them is effective.

Conclusion Among patients with severe EPS, presence of intestinal obstruction, and either Gram-negative or fungal peritonitis are associated with mortality. Presence of hypertension is independently associated with less mortality. None of treatment showed improvement in mortality rate. Identifying the above risk factors with appropriate control measures can minimize complications in EPS cases.

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PREDICTIVE FACTORS OF GLYCEMIC CONTROL AND HYPOGLYCEMIA IN KIDNEY TRANSPLANT RECIPIENTS WITH DIABETES MELLITUS – A SINGLE-CENTRE CROSSSECTIONAL AND COHORT STUDY

Dr Kwok Wing Tung, Department of Medicine & Geriatrics, Kwong Wah Hospital (June 2019 Nephrology Exit Assessment Exercise)

Background Diabetes mellitus (DM) is a major cause of end stage renal disease (ESRD) and new onset diabetes after transplantation (NODAT) is one of the main transplant related medical complications. DM contributes to post-transplant morbidity and mortality. Hypoglycemia has been a major obstacle in achieving satisfactory glycemic control, especially in patients with difficult glycemic control requiring intensive hypoglycemic treatment. Furthermore, studies from overseas have shown that the long-acting basal insulin analogue Glargine is able to reduce the risk of hypoglycemia while accomplishing satisfactory glucose control in patients with normal kidney function. However, its role in the

post-transplant population is unknown. This study evaluates the predictive factors of glycemic control and hypoglycemia in kidney transplant recipients (KTRs) with DM in a local district hospital in Hong Kong. In addition, we assessed the efficacy of insulin analogue Glargine on glycemic control and its attendant risk of hypoglycemia in kidney transplant recipients (KTRs).

Methods This is a single-center retrospective study. Seventy-six prevalent KTRs with DM as of April 2015 were identified and recruited into a cross-sectional study to examine their glycemic control and occurrence of hypoglycemia. Glycemic control was determined by glycated hemoglobin A1c (HbA1c) from patients' records within the preceding 1 year and poor control was defined as HbA1c \geq 8%. Clinically significant hypoglycemia was defined as at least 1 episode of confirmed hypoglycemia with glucose level \leq 3.9mmol/l or at least 2 episodes of probable symptomatic hypoglycemia. Demographic characteristics and laboratory parameters were analyzed to identify predictors of glycemic control and hypoglycemia. In addition, a cohort study was performed on those patients who subsequently switched from human insulin (NPH or pre-mixed insulin) to insulin analogue Glargine as a result of failure to achieve optimal glycemic control or development of frequent hypoglycemia to examine for post-conversion effect.

Results Seventy-six subjects with mean age of 58.8 years and mean duration of 118 months post-transplantation were recruited. Thirty (39.5%) of the 76 patients had pre-transplant DM and 46 had NODAT (60.5%). Twenty-three (30.1%) had HbA1c \geq 8%. As compared to subjects with HbA1c $<$ 8%, subjects with poor glycemic control (HbA1c \geq 8%) were more likely to be current or ex-smokers (43.5 vs 17%, $p=0.014$), having primary renal disease due to DM (60.9 vs 18.9%, $p<0.001$), having pre-transplant DM (73.9 vs 24.5%, $p<0.001$), having DM for a longer duration (13 vs 7 years, $p<0.001$), receiving insulin with or without oral hypoglycemic agents (95.7 vs 28.3%, $p<0.001$), having experienced more hypoglycemia (52.2 vs 9.4%, $p<0.001$), and having higher fasting glucose (6.9 vs 6.2mmol/l, $p=0.011$), triglyceride (2.2 vs 1.5mmol/l, $p=0.031$), creatinine (131.9 vs 107.7 μ mol/l, $p=0.023$) and urea levels (8.7 vs 7.1mmol/l, $p=0.002$). In multivariate analysis, treatment with insulin was independently associated with increased odds for poor glycemic control, while the use of insulin is significantly more prevalent in patients with long standing DM. Seventeen (22.4%) of the 76 patients had hypoglycemia. Patients with hypoglycemia were more likely to have ESRD due to DM (64.7 vs 22%, $p=0.001$), pre-transplant DM (70.6 vs 30.5%, $p=0.003$), a longer duration of DM (15 vs 9 years, $p<0.001$), higher HbA1c (8.6 vs 7.2%, $p<0.001$), urea (8.5 vs 7.3mmol/l, $p=0.049$) and more likely to be receiving human insulin (94.1 vs 35.6%, $p<0.001$). In multivariate analysis, conventional human insulin use was an independent predictor of hypoglycemia in KTRs with DM. Subgroup cohort analysis of 11 KTRs being converted from intermediate acting human insulin or pre-mixed insulin to

insulin analogue Glargine did not show significant change in HbA1c ($p=0.174$) after 12 months, but fasting glucose ($p<0.001$) was higher and the hypoglycemic rate ($p<0.001$) was lower post-conversion.

Conclusion Suboptimal glycemic control and hypoglycemia were common in diabetic KTRs. Treatment with human insulin was an independent predictor of both poor glycemic control and hypoglycemia, with the use of insulin being more common amongst patients with long standing DM. Conversion from human insulin to insulin analogue reduced the risk of hypoglycemia while achieving similar glycemic control in KTRs.

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A RETROSPECTIVE STUDY ON THE ROLE OF DEVICE ASSISTANCE IN EMPOWERING PATIENTS WITH IMPAIRED EYE-HAND COORDINATION TO PERFORM AUTONOMOUS PERITONEAL DIALYSIS

Dr Pak Wai Lun, Department of Medicine & Geriatrics, United Christian Hospital (June 2019 Nephrology Exit Assessment Exercise)

Background and Objectives Peritoneal dialysis (PD) is the most common mode of renal replacement therapy (RRT) in Hong Kong. When physical or cognitive impairment limit the patients' abilities to self-administer PD, helper assistance is required, which entails a lower quality of life, carer stress and family tensions. In United Christian Hospital, a device was invented and has been in use to let patients with impaired eye-hand coordination autonomously perform PD since 2006. This study aims to investigate the outcomes of device-assisted continuous ambulatory peritoneal dialysis (CAPD) compared with helper-assisted CAPD.

Methods All patients who were initiated on autonomous device-assisted CAPD or helper-assisted CAPD as their first mode of long-term RRT in United Christian Hospital from 2007 to 2016 and continued for at least 90 days were recruited. Their baseline characteristics and outcomes were analyzed.

Results There were 120 and 166 patients in the device-assisted and helper-assisted groups respectively. There was a trend towards a lower peritonitis rate in the device-assisted group with 0.440 episode per patient-year, compared with 0.504 in the helper-assisted group ($p = 0.168$). The type of PD assistance was not a significant factor in predicting peritonitis-free survival, technique survival or patient survival in multivariate analyses. Patient outcomes and peritonitis outcomes were similar

Conclusion Device-assisted CAPD demonstrated an acceptable peritonitis rate with

similar technique survival and patient survival as helper-assisted CAPD. It is a valid alternative which empowers patients and relieves their families from the psychosocial or financial burdens due to helper duties.

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DIAGNOSTIC AND PROGNOSTIC VALUE OF GLOMERULAR PLA2R DEPOSITION IN PRIMARY MEMBRANOUS NEPHROPATHY

Dr Shum Tung Sen, Department of Medicine & Geriatrics, Princess Margaret Hospital (June 2019 Nephrology Exit Assessment Exercise)

Background Membranous nephropathy is a common glomerulonephritis in adults. Anti-Phospholipase-A2-Receptor (PLA2R) transmembrane receptor has been identified as a major antigen in primary membranous nephropathy (MN) since 2009. Glomerular PLA2R deposition has been shown to be sensitive in diagnosing primary MN but local data is lacking. Regarding the prognostic value of glomerular PLA2R deposition, clinical data was limited and the results were conflicting.

Objectives This study aims to evaluate the sensitivity of glomerular PLA2R deposition in diagnosing primary MN (primary analysis) and compare clinical outcomes between patients with positive glomerular PLA2R deposition and patients with negative glomerular PLA2R deposition in primary MN (secondary analysis).

Methods This retrospective study included patients who were diagnosed to have MN in Princess Margaret Hospital from April 2014 to December 2018. Clinical Laboratory and histological data were collected by using clinical data analysis and reporting system (CDARS) and electronic patient record (ePR).

Results A total of 48 patients were recruited for the primary analysis. Thirty-three (68.8%) were primary MN and 15 (31.3%) were secondary MN. The sensitivity of glomerular PLA2R deposition in diagnosing primary MN was 66.7% (95% CI, 50.6 to 82.8%), and the specificity was 80% (95% CI, 59.8 to 100%). Thirty cases of primary MN were included in the secondary analysis. Any remission (partial or complete remission) rate of the negative group at 6-month, 12-month and 18-month were all higher than that in positive group, although statistically insignificant (6-month: 66.7% vs. 50%, $p = 0.669$; 12-month: 88.9% vs. 75%, $p = 0.063$; 18-month: 88.9% vs. 83.3%, $p = 1.000$). Time to any remission after immunosuppressive therapy in negative group was also shorter than that in positive group, although again statistically insignificant (4.1 ± 2.3 months vs. 7.1 ± 8.9 months, $p = 0.840$). Kaplan-Meier analysis of any remission over time showed a better response in the negative group but it is statistically insignificant ($p = 0.379$). In subgroup involved patients who have

received CNI only, negative group also demonstrate a better response, but it is again statistically insignificant ($p = 0.080$). Using mixed model with random intercept only, the rate of reduction in eGFR was faster in the positive group although not reaching statistical significance ($p = 0.112$). In the subgroup in which patients received CNI only, the rate of reduction in eGFR was significantly higher in positive group ($p = 0.014$). Three (12.5%) out of 24 patients who received immunosuppressive therapy developed end stage renal failure (ESRF). All of them belonged to the group of positive glomerular PLA2R deposition.

Conclusion The sensitivity and specificity of glomerular PLA2R deposition in diagnosing primary MN are 66.7% and 80% respectively in the current study. Primary MN with negative glomerular PLA2R deposition is shown to have a trend towards better and faster response to immunosuppressive therapy and possibly better long term outcome in terms of rate of reduction in eGFR and progression to ESRF.

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EFFECT OF INITIAL TRANSPORTER STATUS ON CLINICAL OUTCOMES IN CHINESE PERITONEAL DIALYSIS PATIENTS

Dr Yeung Man Ka, Department of Medicine, Tseung Kwan O Hospital (June 2019 Nephrology Exit Assessment Exercise)

Objectives To study the effect of initial transporter status on the clinical outcomes in Chinese peritoneal dialysis patients.

Methods 298 incident peritoneal dialysis patients in a regional hospital were recruited for analysis. Kaplan Meier curve and multivariate cox regression analysis were used to evaluate the relationship between transporter membrane characteristics and the study outcomes (mortality, technique failure and major adverse cardiovascular event).

Results High transporter status was found to be a significant risk factor in univariate analysis for both mortality and technique failure, but not after multivariate cox regression. High transporter was only found to be a significant independent risk factor in the subgroup of non-diabetic population, but not in the diabetic subgroup/ overall study population. Non-diabetic high transporter status was associated with a higher HR of 3.41 ($p = 0.02$) in patient survival and HR of 3.13 ($p = 0.01$) in terms of technique failure (non- death censored). There was no significant association between high transporter status and major adverse cardiovascular event in this study.

Conclusion High transporter group was associated with higher patient mortality

and technique failure, but the result was not statistically significant overall. The effect of transporter status was only significant in non-diabetic subgroup.

Transporter membrane characteristic had no significant effect on the risk of major adverse cardiovascular event (MACE).

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THE EVOLUTION OF ISCHEMIC STROKE MECHANISMS IN HONG KONG

Dr Ip Yiu Ming Bonaventure, Department of Medicine & Therapeutics, Prince of Wales Hospital (June 2019 Neurology Exit Assessment Exercise)

Background Stroke is the leading cause of death and mortality worldwide. Stroke epidemiology is important in stroke prevention and management planning.

Method We conducted a retrospective study on the evolution of stroke mechanisms over a 13-year period (i.e. from 2004 to 2016) in a representative stroke sample in one of the teaching hospitals in Hong Kong. Pre-defined demographic data was retrieved from the stroke registry. The principle investigator determined the stroke mechanism of each patient according to the TOAST classification criteria, another stroke-specialist crosschecked the stroke mechanism for interobserver reliability assessment.

Results We included a total of 5982 patients in the study. Over the 13-year period, the total number of patients diagnosed with stroke/TIA increased by 26.7%. Atrial fibrillation (AF) related stroke increased by 213% ($p < 0.001$), large-artery-disease-related (LAD) stroke decreased by 47.7% ($p < 0.001$). AF-related stroke had the oldest mean age (77.4 ± 11 , $p < 0.001$) and highest day-1 NIHSS (14.8 ± 10.8 , $p < 0.001$). Patients with newly diagnosed AF increased by 200%. Stroke recurrence at 2 years of patients with symptomatic intracranial atherosclerosis (ICAS) decreased from 20.7% to 9.3%.

Conclusion There was significant increase in AF-related stroke and stroke being the first presentation of AF. The result of this study warranted improvement primary prevention measures and acute stroke service with increasing burden of AF-related stroke which was of high mortality and severe disability. The significant decline in LAD-related stroke and its recurrence warranted search for factors that contributed to such phenomenon which may implicate treatment strategies in regions with high ICAS prevalence.

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CLINICAL CHARACTERISTICS AND RISK FACTORS OF HEMORRHAGIC TRANSFORMATION IN PATIENTS WITH ACUTE ISCHEMIC STROKE: A RETROSPECTIVE STUDY OVER YEAR 2013-2018

Dr Kwan Chung Hon, Integrated Medical Service, Ruttonjee Hospital (June 2019 Neurology Exit Assessment Exercise)

Background Hemorrhagic transformation (HgT) of acute ischemic stroke is common and can cause increased mortality, morbidity and create dilemma in management. However, local demographic data concerning HgT is limited.

Objective The study aims to delineate the clinical characteristics of acute ischemic stroke patients with HgT in Hong Kong and evaluate associated clinical risk factors.

Methods 115 patients admitted during year 2013 to 2018 with diagnosis of acute ischemic stroke and with HgT developed within 14 days of stroke onset were included. 66 out of 115 patients were clinical significant HgT (CSHgT). 228 ischemic stroke patients of the same period without HgT and with repeated CT brain within 14 days were included for comparison. Demographics characteristics of patients with HgT and CSHgT were recorded, analyzed and compared with those without HgT. Univariate analysis was performed to identify potential variables associated with HgT and CSHgT. Then multivariate logistic regression was performed, with HgT and CSHgT as dependent variables.

Results HgT patients have comparable 3-month survival to patients without HgT (77.9% VS 85.8%, $p = 0.094$). CSHgT patients have poorer post-stroke outcomes, including lower 3-month survival of only 73.4% ($p = 0.033$), higher mRS at 1-month ($p = 0.007$) and 3-month ($p = 0.010$) post-stroke, compared to non-HgT patients. Presence of AF or atrial flutter (OR 12.27 for HgT and OR 14.02 for CSHgT, both $p < 0.001$) and infarct size (OR 1.011, $p = 0.001$ for HgT; OR 1.010, $p = 0.006$ for CSHgT) are independent factors associated with increasing HgT and CSHgT risks.

Conclusion CSHgT but not all HgT is associated with increased mortality and morbidity. Presence of AF and larger infarct volume are identified as independent variables for higher risks of HgT and CSHgT.

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PREVALENCE AND CLINICAL CHARACTERISTICS OF ASTHMA-COPD OVERLAP (ACO) IN ASTHMA AND COPD PATIENTS IN HONG KONG

Dr Lo Lai Ping, Department of Medicine & Therapeutics, Prince of Wales Hospital (June 2019 Respiratory Medicine Exit Assessment Exercise)

Background Coexistence of asthma and Chronic obstructive pulmonary disease (COPD) among patients, Asthma-COPD overlap (ACO), has long been recognized. Studies have shown that ACO patients are more symptomatic, have more exacerbations, more impairment in health-related quality of life and utilize more medical resources when compared to patients with COPD alone. However, its definition, prevalence, characteristics, prognosis and best treatment are not yet well established. Data on the characteristics and

outcome of ACO patients are very limited in Hong Kong.

Method We performed a prospective cross-sectional study to assess the prevalence and clinical characteristics of patients with ACO among patients diagnosed with COPD and asthma at the out-patient clinics of the Prince of Wales Hospital.

Results 187 patients with asthma and 164 patients with COPD were recruited. ACO, as defined by the joint Global Initiative for Asthma (GINA) and Global Initiative for Chronic Obstructive Lung Disease (GOLD) recommendations, was found in 14 (7.5%) and 34 (20.7%) of patients with asthma and COPD respectively.

Compared with asthma patients, ACO patients were older, predominantly male and had higher lifetime smoking intensity. They had higher frequencies of rhinitis and tuberculosis. They had more frequent exacerbation of the disease and fewer positive skin prick tests . Their lung function was more obstructive (lower pre-bronchodilator forced expiratory volume in one second (FEV1) (absolute and percentage predicted values) and pre- and post-bronchodilator FEV1 over forced vital capacity (FVC) ratio). They were prescribed with less ICS/LABA and montelukast compared with asthma patients.

Compared with COPD patients, ACO patients had a lower percentage of smokers but a higher percentage of rhinitis and a longer distance in 6-minute walk test. They had less obstructive lung function (higher pre- and post-bronchodilator FEV1 (absolute and percentage predicted values) and higher FEV1 change (absolute value)). Significantly more ACO patients were put on ICS/LABA combination and montelukast but less on LABA/LAMA compared with COPD patients.

The most common treatment options for ACO patients were ICS/LABA (70.8%) and LAMA (52.1%).

Conclusion ACO was present in 7.5% of asthma and 20.7% of COPD patients. The most common inhalers in ACO group were ICS/LABA and LAMA. Compared with asthma patients, ACO patients were older, with male predominance, had more smokers and pulmonary tuberculosis. They were less atopic with lower percentage of rhinitis and less positive skin prick test. They had more frequent exacerbations with worse lung function. Compared with COPD patients, ACO patients had more rhinitis, better exercise tolerance and better lung function.

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EFFECT OF IN-PATIENT PULMONARY REHABILITATION PROGRAM IN ADVANCED CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS

Dr Tsui Yuk Wo, Department of Medicine & Geriatrics, Tuen Mun Hospital (June 2019 Respiratory Medicine Exit Assessment Exercise)

Background Chronic obstructive pulmonary disease (COPD) brings considerable burden to health care in Hong Kong, despite there are many new drugs available for treatment of COPD. Pulmonary rehabilitation is a cost effective treatment for patients with moderate to severe COPD. We would like to assess the effect of in-patient structured pulmonary rehabilitation program on hospital admission and patients' quality of life.

Methods 82 male patients with moderate to severe COPD were recruited initially and 73 of them completed 4 weeks in-patient pulmonary rehabilitation program (PRP). We compared the patients' pre-rehabilitation and post-rehabilitation six minute walk test, incremental shuttle walk test, CRQ score and MFTE. We also looked at the total hospital stay due to COPD 12 months before rehabilitation and after rehabilitation.

Results Substantial improvement in physical ability was noted after rehabilitation by 40m in both six minute walk test (IQR 0-100m) and incremental shuttle walk test (IQR 17.5-70m). Significant boost in all domains of CRQ and MFTE (pre: 12.5, IQR 10.5-15.2, post: 15.1, IQR 12.9-17.0) were noted. The hospital length of stay was shortened from 37 days (IQR 18-57) in 12 months prior rehabilitation to 12 days (IQR 0-40) 1 year after pulmonary rehabilitation.

Conclusion A structured 4 weeks in-patient pulmonary rehabilitation program could improve physical condition, quality of life, functional status in moderate to severe COPD patients. It also aided to shorten the hospital stay within a year.

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PREVALENCE OF MEDICATION ADHERENCE AND ASSOCIATED RISK FACTORS OF NON-ADHERENCE IN PSORIATIC ARTHRITIS (PSA) AND RHEUMATOID ARTHRITIS (RA) PATIENTS- A CROSS SECTIONAL STUDY IN A LOCAL HOSPITAL

Dr Au Chi Kit, Department of Medicine, Tseung Kwan O Hospital (June 2019 Rheumatology Exit Assessment Exercise)

Background Rheumatoid arthritis (RA) and Psoriatic arthritis (PsA) are chronic autoimmune disorders that affect the quality of life of many patients. A majority of them are required to take long term medications in order to achieve a low disease activity and thus medication adherence is crucial. There is a lack of data on medication non-adherence among patients with RA and PsA in Hong Kong. Many proposed factors have been suggested in

various studies including age (1, 2), disease activity (2, 3), belief of necessity (4, 5), concerns (5), cognitive (6) and psychosocial factors (7).

Objective The objective is to determine the frequency of adherence in patients with RA and PsA. Further analysis will be done to look for any factors that may be associated with poor drug adherence.

Results Total 160 rheumatic patients were recruited: 80 were RA and 80 were PsA patients. Using MAR5 questionnaire, 51.25% (41/80) RA and 52.5% (42/80) PsA patients were identified as drug adherers, while 73.65% (59/80) RA and 75% (60/80) PsA patients were drug adherers when using the CQR5 questionnaire.

For RA patients, younger age ($p=0.003$), higher MoCA score ($p=0.006$), possible anxiety ($p=0.032$) and depressive disorders ($p=0.036$), history of treatment failure ($p=0.036$) and the use of more than one DMARD ($p=0.02$) were associated risk factors of drug non-adherence. For PsA patients, the associated factors were concerns about the medications ($p=0.001$), possible anxiety disorders ($p=0.011$) and lower level of satisfaction with information about medicines, ($p=0.043$) while the use of biologics ($p=0.02$), history of treatment failure ($p=0.009$) and side effects ($p=0.03$) were found in drug adherers. In addition, the MoCA scores were found to be significantly lower in RA and PsA patients compared to patients without the diseases ($p=0.000$).

Conclusion A combination of different measurement tools should be used to more comprehensively evaluate different aspects of risk factors that may determine the drug non-adherence in RA and PsA patients. Modifiable factors should be addressed to improve the compliance rate so as to improve the patient's outcome and reduce the healthcare burden.

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EFFECT OF THE METABOLIC SYNDROME (METS) ON INCIDENCE OF VASCULAR EVENTS AND MORTALITY IN FOUR COMMON RHEUMATIC DISEASES IN HONG KONG

Dr Chu Chiu Sum, Department of Medicine & Geriatrics, Tuen Mun Hospital (June 2019 Rheumatology Exit Assessment Exercise)

Introduction Rheumatic diseases are associated with accelerated atherosclerosis and cardiovascular complications as a result of increased incidence of traditional Framingham's risk factors and disease-specific factors such as cytokines and adipokines. The MetS, which is a constellation of traditional risk factors, is strongly associated with vascular events in the general population. However, the significance of the MetS in Chinese patients with rheumatic diseases is not clear.

Objectives To study the effect of the MetS on incident vascular events and mortality in four rheumatic diseases.

Methods Consecutive patients with rheumatoid arthritis (RA), psoriatic arthritis

(PsA), spondyloarthritis (SpA) and systemic lupus erythematosus (SLE) were recruited in a ten-month period between 2009 and 2010. Demographics, clinical, laboratory and anthropometric data were recorded at baseline. This group of patients was followed 2 longitudinally for eight years for occurrence of new vascular events and mortality. Comparison was made between those with and without the MetS at baseline. Cox regression model was used to identify independent risk factors associated with development of various vascular complications and mortality.

Results One thousand four hundred and ninety-seven patients were recruited in the study. The mean age at entry was 47.3 + 13.9 years old, with 78% of subjects being women. At baseline, 274 (18%) patients had MetS. After eight years, 85 (5.6%) patients had new vascular complications, with 51 (3.4%) cardiovascular and 29 (1.9%) cerebrovascular events respectively. Mortality occurred in 99 (6.5%) patients, among whom 12 (0.8%) were attributed to vascular causes. MetS at baseline was an independent risk factor for development new cardiac (HR 1.98 [1.08-3.63]; $p = 0.03$) and any vascular (HR 1.64 [1.01-2.66]; $p = 0.04$) events after adjusting for age at entry, disease duration, sex, ever smoking, presence of SLE, and elevated LDL > 2.6 mmol/L. However, MetS at baseline was not independently associated with all-cause or vascular mortality.

SLE was found to be independently associated with new cerebrovascular events (HR 4.66 [1.80-12.1]; $p = 0.02$) after adjusting for the same covariates including presence 3 of MetS. Factors independently associated with all-cause mortality included increasing age (HR 1.12 [1.10-1.14]; $p < 0.001$), ever smoking (HR 3.26 [1.82-5.84]; $p < 0.001$) and underlying SLE (HR 3.18 [1.88-5.37]; $p < 0.001$).

Conclusion MetS was fairly common in Chinese patients with underlying chronic rheumatic diseases. The presence of MetS at baseline increased the risk of new vascular and cardiac events over eight years, independent of underlying diseases and other risk factors. This should prompt strict control and vigilant screening of traditional vascular risk factors in patients suffering from chronic rheumatic diseases.

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RISK OF HEPATITIS B REACTIVATION IN HBSAG-NEGATIVE / ANTI-HBC-POSITIVE PATIENTS UNDERGOING BIOLOGICAL AND TARGETED SYNTHETIC (B/Ts) DMARDS THERAPY FOR RHEUMATIC DISEASES

Dr Chung Man Ho, Department of Medicine, Queen Mary Hospital (June 2019 Rheumatology Exit Assessment Exercise)

Background Studies from Asian and European countries have demonstrated a low risk of HBV reactivation in patients who are HBsAg-negative and anti-HBc-positive with rheumatic diseases undergoing various b/tsDMARDs. Data regarding Chinese patients in Hong Kong is not available. Local guidelines have not specified the management strategy for these patients.

Methods Clinical records of patients with various rheumatic diseases undergoing bDMARDs or tsDMARDs in Queen Mary Hospital and Tuen Mun Hospital were retrieved. Patients with a serological profile of HBsAg -ve, anti-HBc +ve were included for analysis. Those with baseline detectable HBV DNA were excluded. HBV reactivation was defined as either detectable HBV DNA from a baseline undetectable level or the occurrence of reverse HBsAg seroconversion. Risk factors for HBV reactivation were studied by the Cox regression model.

Results Among the 180 patients recruited into the study, 9 patients (5%) developed HBV reactivation during a median follow-up of 14.5 months. The incidence of HBV reactivation in the current study was 2.76 per 100 person-years, occurring at a median of 6 months. Twenty-six patients were put on prophylactic antiviral treatment at baseline, none of them developed reactivation. None of those who had reactivation developed overt hepatitis or

liver failure, HBV DNA became undetectable or remained at non-quantifiable levels after antiviral treatment (44.4%, 4/9) or close monitoring (55.6%, 5/9).

Conclusion The risk of HBV reactivation was low (5%) among Chinese patients in Hong Kong who were HBsAg-negative and anti-HBc-positive receiving b/tsDMARDs for various rheumatic diseases. HBV reactivations that occurred were mild and the outcomes were good.

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ANALYSIS OF SURVIVAL ASSOCIATED WITH PULMONARY ARTERIAL HYPERTENSION IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

Dr Ho Chi, Department of Medicine, North District Hospital (June 2019 Rheumatology Exit Assessment Exercise)

Objectives To examine clinical, serological and echocardiographic features that are predictors of mortality in systemic lupus erythematosus (SLE) related pulmonary arterial hypertension (PAH).

Methods Data on SLE-PAH patients (SLE-PAH group, n=67) attending the Prince of Wales Hospital, from 2008 to 2018 were retrieved. PAH was defined as echocardiogram showing pulmonary artery systolic pressure (PASP) \geq 35mmHg. Age-, sex- and disease duration-matched SLE patients with PASP < 35mm Hg were selected as control (SLE-non-PAH group, n=154). Clinical, serological, and echocardiographic features and medication at baseline were collected. Censor date were death or last visit on or before 31st December 2018. Hazard ratio was analysed by cox regression model, and adjusted by age, sex, disease duration and co-morbidities.

Results At baseline, the mean +/- SD age of the entire cohort (n= 221) was 42.7 +/- 12.6 years old with 96.3% female, and a disease duration of 8.3 +/- 7.6 years. After a mean follow-up of 9.0 +/- 4.5 years, 14/67 (20.1%) and 8/154 (0.05%) died in the PAH and control group, with a relative mortality rate of group was 3.2 after adjusting for baseline parameters (age-, sex-, disease-duration, comorbidities) and medication used after the diagnosis of PAH. Within SLE-PAH group, patients with age 50 or older, renal impairment, anti-phospholipid syndrome and severe tricuspid regurgitation at baseline had poorer survival.

Conclusion SLE-PAH was associated with a 3.2-fold increase in mortality. Age 50 or older, renal disease, anti-phospholipid syndrome and severe tricuspid regurgitation were associated with poor survival outcome in SLE-PAH patients.

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Note: For obtaining the full dissertation, please contact the author directly.